A revision of the carabid tribe Migadopini in Australia (Insecta: Coleoptera: Carabidae: Migadopini)

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ABSTRACT

The Australian members of the carabid tribe Migadopini are revised. A new genus and four species and one additional subspecies are newly described: *Dendromigadops* gen. nov. with the species *D. alticola* sp. nov. from mountains on Atherton Tableland in North Queensland and *D. gloriosus* sp. nov. from Mt. Glorious in South-east Queensland, *Stichonotus decoloratus* sp. nov. from Tasmania, *Calyptogonia lynetteae* sp. nov. from north-western Tasmania, and *Cayptogonia atra occidentalis* subsp. nov. from western Tasmania. The genera *Nebriosoma* Castelnau, 1867, *Stichonotus* Sloane, 1910, *Decogmus* Sloane, 1915, and *Calyptogonia* Sloane, 1920 are partly redescribed and the male genitalia and female gonocoxites of all species are figured. Keys to the genera of the Australian Migadopini and to the species of *Dendromigadops*, *Stichonotus*, and *Calyptogonia* are provided. According to the structure of their female gonocoxites *Dendromigadops* belongs in the subtribe Migadopina and is related to *Decogmus* and *Calyptogonia*, but in body shape it is quite distinct from all described Australian genera of the subtribe. ❐ *Coleoptera, Carabidae, Migadopini, Dendromigadops, new genus, new species, Stichonotus, new species, Calyptogonia, new species, Nebriosoma, Stichonotus, Decogmus, Calyptogonia, partial redecriptions, key to Migadopine genera, keys to the species of Dendromigadops, Stichonotus, and Calyptogonia, Australia.*

While searching through the unidentified material of Carabid beetles in the Australian National Insect Collection, Canberra (ANIC), for additional material for a projected key to the genera of Australian Carabidae, I detected two strangely shaped, large specimens of the tribe Migadopini that did not seem to fit into any of the described Australian genera of this tribe. On closer examination of the specimens at home, I remembered that I had seen a similar specimen years earlier in the Queensland Museum, Brisbane. I had postponed an examination on initial advice that Geoff Monteith (former Curator, Queensland Museum) had informed me of similar specimens located at ANIC, these are those specimens. On my request Geoff kindly loaned the QM specimen which agree well with one of the ANIC specimens. Since the enigmatic species *Nebriosoma fallax* Castelnau, 1867, the only Australian migadopine genus that I had not yet seen, had not been studied by modern workers, I suspected that these specimens might be related to it. On my request, the holotype, and apparently single recorded specimen, was loaned to me by R. Poggi of the Genoa Museum However, examination showed that *Nebriosoma fallax* is completely different in body shape and structure from the specimens mentioned above, so these represent an additional new genus. Examination of the specimens further revealed some differences in body shape and

surface structure between the specimens from North and South Queensland, respectively. Therefore two new species are described, even though all available specimens are females.

While seeking additional information about *Nebriosoma* I discovered that another putative 'holotype' exists in Museum of Victoria, Melbourne, which was not noted by B. P. Moore in his catalogue of the Australian Carabidae (Moore et al. 1987). Examination revealed it to be a male which gives me the opportunity now to figure male and female genitalia of all Australian Migadopini except those of *Dendromigadops* and one species of *Migadopidiella* Baehr, the latter genus belonging in the subtribe Amarotypina.

In the course of dissecting male and female genitalia of all known Australian migadopine species I also detected that the material previously identified as *S. leai* Sloane is composed of two different species and that *Calyptogonia atra* Sloane includes three different taxa, two of which are represented in the type series. These new species and subspecies are described in the present paper.

Different authors do not agree about the taxonomical status of the migadopine beetles. For the present paper I prefer to recognise Migadopini as a tribe, not as a subfamily. At present Migadopini includes 17 genera with about 40 species and a couple of subspecies. The tribe is famous for its circumantarctic distribution, occurring in the southern part of South America north to Uruguay, on Falkland Islands, Auckland Island, in Tasmania and south-eastern Australia, and in New Zealand (Sloane 1920, Jeannel 1938, Lorenz 1998, 2005, Larochelle & Larivière 2001, 2007, Roig-Juñent (2004), Baehr 2009, Johns 2010). However, undescribed species (and perhaps even genera) may occur throughout the range of the tribe, and for New Zealand Larochelle & Larivière (2001) and Johns (2010) explicitly stated the occurrence of several additional undescribed species.

Based mainly on structures of the female genitalia, Migadopini had been split into two subtribes: Migadopina which include almost all described genera, and Amarotypina which so far includes only two genera: *Amarotypus* Bates,1872 with the single presently described species *Amarotypus edwardsii* Bates, 1872 from New Zealand (Erwin 1985, Liebherr & Will 1998, Larochelle & Larivière 2007), and *Migadopidiella* Baehr, 2009 from Tasmania with the two species *Migadopidiella couvexipennis* Baehr, 2009 and *M. octoguttata* Baehr, 2009. In New Zealand other species of *Amaratypus* are also known and await description (Johns 2010).

Migadopini *s. l.* combines several characters: presence of a single supraorbital seta, absence of lateral pronotal setae, presence of an additional 10th stria (probably resulting from the parascutellary stria being complete), closed procoxal cavities, disjunct mesocoxal cavities, simple antenna cleaner on the protibia, and large parameres of which at least the right one is densely setose. A couple of these character states are very plesiomorphic and hence Migadopini, in all phylogenetic surveys, are believed to have their position near the base of the carabid phylogenetic tree. Commonly they are ranked near Elaphrini, but according to Liebherr & Will (1998) the female genitalia of only *Amarotypus* are similar to those of Elaphrini, whereas those of all other genera (= the subtribe Migadopina) are quite different.

The absence of any discal elytral setae, formerly thought to be another character common to all migadopine species, must be removed from the general diagnosis, because *Nebriosoma* and *Decogmus* have a distinct puncture in the basal third of the 4th interval but apparently no seta.

In Amarotypina not only the female genitalia differ from those of the Migadopina s. str., but the male aedeagus is also different: it has the orifice (i.e the apical ostium) situated on the left side of the apex, while in Migadopini it is situated on the right side; and the left paramere is quite differently shaped and asetose, while in most other migadopine genera it is setose at the apex. Migadopina and Amarotypina hence may represent quite different groups which are similar only in a number of plesiomorphic

characters states that cannot serve as evidence of close relationship of both subtribes. Hence they have been ranked by some authors, and probably should be ranked, as separate and not too closely related tribes.

From Australia five migadopine genera were recorded so far, namely in Migadopina s. str.: *Nebriosoma* Castelnau, 1867, with the single species *N. fallax*, Castelnau, 1867 from south-eastern NSW, *Stichonotus* Sloane, 1910, with three species living in Tasmania and southern Victoria, *Decognuus* Sloane, 1915 with the single species *D. chalybaeus* Sloane, 1915 from central-eastern NSW, and *Calyptogonia* Sloane, 1920 with the single species *C. atra* Sloane, 1920, from Tasmania; and in Amarotypina: *Migadopidiella* Baehr, 2009, with two species from central Tasmania. Sloane (1915, 1920) provided keys for the then known genera of Australian Migadopini.

No migadopine species hitherto was recorded from north of Comboyne Plateau in central near-coastal NSW. Hence the discovery of a species as far north as the mountain ranges at the margins of the Atherton Tableland in north-eastern Queensland is surprising.

MATERIAL AND METHODS

About 300 specimens were examined in the course of this study. However, the overwhelming number belongs to two species of the genus *Stichonotus*, whereas of most other species only single or few specimens were available, and actually are recorded.

The holotypes of the new species are shared with the Australian National Insect Collection, Canberra (ANIC), Queensland Museum, Brisbane (QM), and Forestry Tasmania Insect Collection, Hobart (FTIC). Other types and material are shared with Museo Civico di Storia Naturale 'Giacomo Doria', Genoa (MCSN), Museum of Victoria, Melbourne (NMV), The Natural History Museum, London (NHM), South Australian Museum, Adelaide (SAMA), ANIC, FTIC, and the working collection of the author in Zoologische Staatssammlung, München (CBM).

Measurements were taken using a stereo microscope with an ocular micrometer. Body length was measured from apex of labrum to apex of elytra, length of pronotum along midline, length of elytra from the most advanced part of the humerus to the very apex.

For dissection of the genitalia of both sexes specimens were softened for a night in a jar under moist atmosphere, then the genitalia were removed and subsequently cleaned for a short while in hot KOH. The habitus photographs were obtained with a digital camera using AutoMontage and subsequently were worked with Corel Photo Paint X4.

ABBREVIATIONS

NSW .....New South Wales
Vic ..... Victoria
Qld.....Queensland
Tas .....Tasmania
C ..... central
CE ..... central eastern
E .....eastern
NE ..... north-eastern
NW .....north-western
S ..... southern
SE ..... south-eastern
SW .....south-western
> ..... larger or longer than
< ..... smaller or shorter than

KEY TO THE AUSTRALIAN GENERA OF THE TRIBE MIGADOPINI

1. Apical angles of pronotum acute, much protruded, head deeply retracted in the prothorax (Figs 18, 22-25).....2
– Apical angles of pronotum obtuse, little or not protruded, head not imbedded in the prothorax (Figs 19-21).....3

2. Large, relatively elongate, body length >11 mm; eye very large; pronotum with wide, thick lateral margin (Figs

26, 27); elytra elongate, parallel-sided, striae distinctly crenulate (Fig. 18); aedeagus unknown; female gonocoxite 1 odd shaped and very densely setose, gonocoxite 2 asymmetrically inserted (Figs 1, 2). E QLD..... *Dendromigadops* gen. nov.

– Small, relatively wide, body length <8.5 mm; eye smaller; pronotum with narrow lateral margin; elytra obovate, striae not or little crenulate (Figs 22-25); aedeagus very narrow and elongate (Figs 14-17), female gonocoxites straight, more or less densely setose, gonocoxite 1 inserted at apex (Figs 6-9). Tas., S. Vic. . . *Stichonotus* Sloane, 1910

3. Small, body length < 5 mm; elytra markedly oval, striae punctate (see figs 1, 2 in Baehr 2009); aedeagus compact, orifice on the left side, internal sac with several complexly coiled, denticulate sclerites, left paramere asetose at apex (see fig. 3 in Baehr 2009). Tas..... *Migadopidiella* Baehr, 2009

– Large, body length > 8 mm; elytra not or far less oval-shaped, striae impunctate (Figs 19-21); aedeagus variously shaped but orifice on the right side, left paramere setose at apex (Figs 10-13) 4

4. Dorsal surface greenish-violaceous, slightly metallic; mandibles elongate, straight; elytra elongate, parallel-sided (Fig. 20); aedeagus elongate, narrower, lower surface less concave, apex not much enlarged, nor with a markedly denticulate sclerite, both parameres rather similarly shaped (Fig. 11). CE NSW ..... *Decogmus* Sloane, 1915

– Dorsal surface brown or black, not metallic; mandibles shorter, rounded; elytra either shorter (Fig. 19) or slightly oviform (Fig. 21); aedeagus stouter, wider, lower surface very concave, either apex much enlarged, or with a markedly denticulate sclerite; parameres quite dissimilar (Figs 10, 12, 13).....5

5. Large, body length >11 mm; eye depressed; pronotum not cordiform, lateral margin thick; elytra oblong, slightly oval, striae rather superficial (Fig. 21); aedeagus regularly curved on lower surface, with wide, leaf-like apex (Figs 12, 13); female gonocoxite 1 very densely setose with elongate, nematiform setae, gonocoxite 2 small, narrow, parallel sided (Fig. 5). Tas. . . *Calyptogonia* Sloane, 1920

– Small, body length c. 8 mm; eye laterally protruded; pronotum very cordiform, lateral margin narrow, but marginal sulcus wide; elytra short and wide, not oviform, striae deep (Fig. 19); aedeagus irregularly curved on lower surface, apex with a markedly denticulate sclerite (Fig. 10); female gonocoxite 1 sparsely setose with short and stout setae, gonocoxite 2 large, obliquely triangular (Fig. 3). SE NSW..... *Nebriosoma* Castelnau, 1867

Dendromigadops Gen. Nov.

Type species. *Dendromigadops alticola*, sp. nov., by present designation.

Etymology. The name is a combination of the Greek word '*dendron*' which means 'tree' and the noun *Migadops*, and refers to the putative arboricolous habits of the species of this genus. Masculine.

Diagnosis. Genus of the tribe (or subfamily) Migadopini (-inae) and the subtribe Migadopina, characterised by the following features which are not repeated in full length in the descriptions of the species: head deeply retracted into in the prothorax; eye very large, immediately touching the apex of the pronotum; clypeus bisetose; labrum short and transverse, apex slightly excised, 6-setose; mandibles short and wide, depressed, regularly curved, with wide and deep scrobe; both palpi impilose, the apical palpomere of the maxillary palpus narrow, slightly widened apicad and slightly transverse; the apical palpomere of the labial palpus in the female securiform; mentum with wide, apically transverse tooth, bisetose; glossa elongate, narrow, apicad acute, with one or two elongate apical setae; paraglossae hyaline, much shorter than glossa; lacinia large, with sparse, elongate spines and hairs; antenna fairly elongate, just surpassing base of pronotum; median antennomeres 2-2.5 × as long as wide; four basal antennomeres impilose, antenna densely pilose from 5th antennomere; a single supraorbital seta present, located at middle of eye; pronotum wide, depressed; apex very deeply excised, apical angles far protruded and acute; base bisinuate; lateral margin wide and thick,

asetose; elytra elongate and rather depressed; humerus angulate, apex oblique-convex, not sinuate; completely striate, striae more or less crenulate; disk asetose; microreticulation extremely fine and dense, consisting of very fine transverse lines; metathoracic wings fully developed; terminal abdominal sternum in female bisetose; 4th tarsomeres not widened nor excised; lower surface of 5th tarsomeres asetose; 1st – 3rd tarsomeres of female protarsus and mesotarsus biseriately squamose; tarsal claws large; aedeagus unknown; female gonocoxites remarkably odd-shaped: gonocoxite 1 curved, with very wide, convex apex, a hyaline area at median margin at the insertion of gonocoxite 2, at apex and in apical part of the ventral surface densely setose with short and stout, at apex obtuse setae, the remainder of the ventral surface, and the median part of the dorsal surface densely setose with elongate nematiform setae; gonocoxite 2 very asymmetrically inserted at subapical lateral margin of gonocoxite 1, small, narrow, slightly curved, at apex with 1 nematiform seta which originates from a circular groove.

Distribution. Mountains near the coast in both northeastern and southeastern Queensland.

Relationships. Because the male genitalia are unknown, the relationships of the genus remain somewhat obscure. However, the markedly deeply excised apex of the prothorax and the deeply retracted head are similar to the structure of head and prothorax of species in the genus Stichonotus. Shape and structure of the female gonocoxites, on the other hand, in particular the narrow gonocoxite 2, the presence of short apically obtuse hairs on the apical part of gonocoxite 1, and in the very dense and elongate setosity of gonocoxite 2, is most similar to those of species of *Decogmus* and *Calyptogonia*. These, however, in their external morphology have little in common with *Dendromigadops*. Nevertheless, because the female genitalia in Carabidae commonly better depict relationships than many other character sets, I believe that these two genera are the closest relatives of *Dendromigadops*.

Dendromigadops alticola sp. nov.
(Figs 1, 18, 26)

Material. Holotype: ♀, Mt Bartle-Frere, N. Qld. NW/Centre Peak ridge 7-8.xi.1981, 1400–1500 m Earthwatch/Qld.Mus. / Coll. G. Monteith on tree trunk at night (QMT183295). – Paratype: ♀, 17.27S 145.29E Qld GS3 Hugh Nelson Ra 2 Oct- 1 Nov 1995 L. Umback, 1150 m Malaise trap (ANIC).

Etymology. The species name is a masculine noun and reflects the occurrence high up in mountains.

Diagnosis. Distinguished from *Dendromigadops gloriosus* sp. nov. from southeastern Queensland by larger body size, wider, towards apex more incurved pronotum, wider lateral margin of the pronotum, posterior transverse sulcus and basal groove united by a transverse sulcus, more acute humeral angle, more distinctly crenulate elytral striae, and slightly differently shaped female gonocoxites.

Description. *Measurements.* Length: 12.2-12.85 mm; width: 5.3-5.55 mm. Ratios. Width/length of pronotum: 1.92-1.96; width base/apex of pronotum: 1.54-1.57; width widest diameter/base of pronotum: 1.07; width of pronotum/width of head: 1.76-1.80; length/width of elytra: 1.57-1.58; width elytra/pronotum: 1.18-1.20.

Colour. (Fig 18) Black, lateral margin of pronotum piceous; mouth parts and antenna reddish-piceous, legs and lower surface dark piceous to black.

Head. (Figs 18, 26) Medium sized; frons in middle with a shallow, horseshoe-shaped impression; in middle of frons with some fine, transverse wrinkles, orbits laterally rather rugose. Surface of head with very dense, distinct but extremely fine, isodiametric microreticulation, with scattered, fine punctures which are almost invisible within the dense microreticulation; surface moderately dull.

Pronotum. (Fig. 18, 26) Very wide, widest at about basal third. Apex very deeply excised, anterior angles acute; lateral margin convex throughout, also markedly incurved to middle posteriad, basal angle very small, dentiform. Apex distinctly margined, base not margined. Lateral margin very wide, with a narrow sulcus in anterior half which suddenly widens posteriad and meets

the oblique, linear lateral basal groove at a less than 90° angle. Disk depressed, median line distinct though shallow, neither reaching apex nor base. Anterior transverse sulcus shallow, posterior transverse sulcus deep but shortly interrupted in middle. Median basal groove linear and meeting the posterior transverse sulcus which is connected by a shallow but distinct sulcus with the marginal groove and the lateral basal groove. Surface with extremely fine and very superficial microreticulation which is composed of very irregularly transverse meshes, and with extremely fine, rather sparse punctures only visible under very high magnification. Surface moderately glossy.

Elytra. (Fig. 18) Rather elongate, parallel-sided, dorsal surface convex in middle, wide at humerus which is angulate. Lateral margin straight in basal three fifths, then evenly convex towards suture. Base not margined, marginal channel narrow throughout. Striae complete, rather deep, all distinctly crenulate almost to apex, intervals gently convex. Parascutellary pore located at meeting point of 2nd and 3rd striae, seta short. Disk asetose. 14–15 marginal punctures present, series slightly interrupted in middle, an additional puncture and seta at apex of 2nd stria, setae rather short. Microreticulation on intervals extremely fine and very superficial, composed of very dense, very transverse meshes and transverse lines, no distinct punctures visible. Surface rather glossy and slightly iridescent.

Lower surface. Prosternal process at apex carinate and produced. Metepisternum moderately elongate, c. 1.5 × as long as wide at apex. Lateral parts of prosternum and the proepimeron finely punctate-rugose, the lateral parts of mesosternum and metasternum, the metepimeron, and the anterior, widened part of the elytral epipleura coarsely punctate. Abdomen laterally irregularly and very coarsely punctate. Microreticulation very fine though distinct, composed of irregular, slightly transverse meshes.

Male genitalia. Unknown.

Female gonocoxites. (Fig. 1) As in genus diagnosis. Gonocoxite 1 laterally below insertion of gonocoxite 2 angulate, ventral surface also in middle rather densely setose, setae elongate; gonocoxite 2 small, moderately narrow, slightly curved, widened towards apex.

Variation. Very little variation noted. In the paratype the crenulation of the lateral elytral striae is slightly coarser.

Distribution. Mountains at the margins of Atherton Tableland in northeastern Queensland.

Collecting circumstances. According to information from Geoff Monteith the holotype was collected at night running on the bark of a living tree trunk, about 4m from the ground, at high altitude in montane rain forest. The paratype was also sampled at high altitude, but in a ground-based Malaise trap.

Dendromigadops gloriosus sp. nov.
(Figs 2, 27)

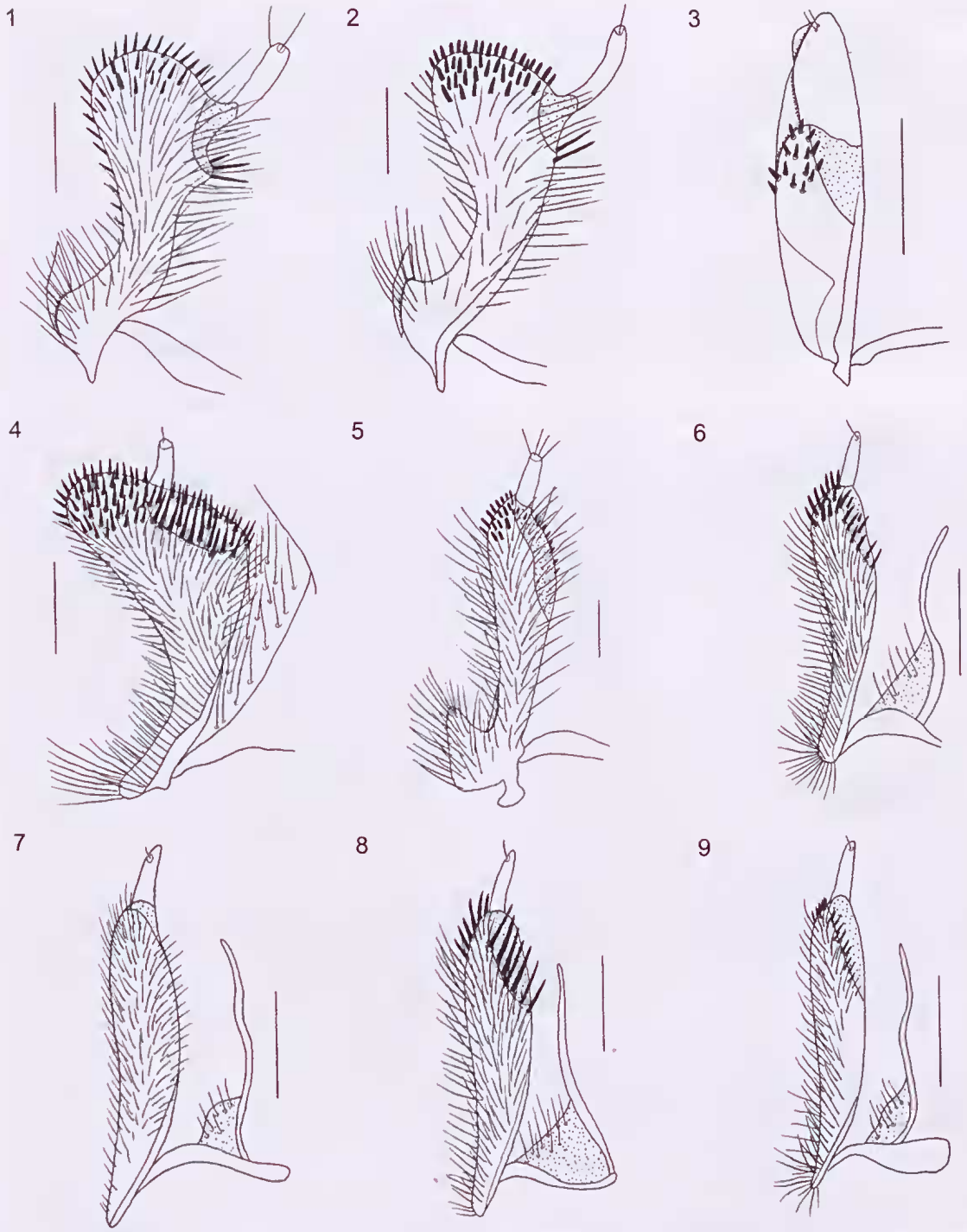
Material. HOLOTYPE ♀, SE. Qld; 27.3219°S, 152.7502°E, Mt Glorious, Daguilar NP, 700 m, 1988-89, canopy intercept trap in *Argyrodendron actinophyllum* in subtropical rainforest, Y. Basset/ Co/Car.19/ Migadopinae genus ?? det. T.A. WEIR 2010 (ANIC).

Etymology. The species name reflects the occurrence on Mt Glorious near Brisbane.

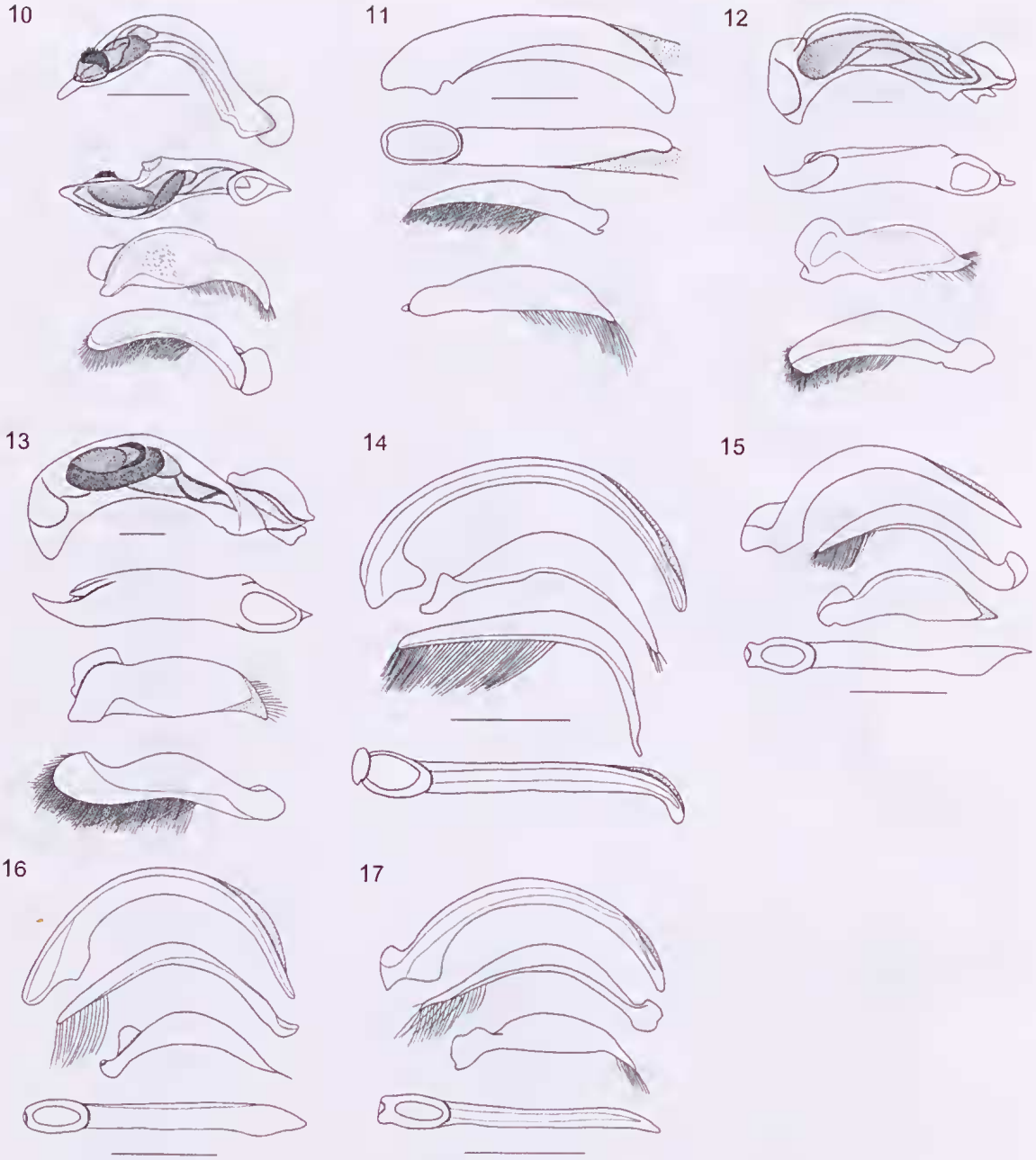
Diagnosis. Distinguished from *Dendromigadops alticola* sp. nov. from northeastern Queensland by smaller body size, narrower, towards apex less incurved pronotum, narrower lateral margin of the pronotum, the basal transverse sulcus and the basal groove separated by a low boss, less acute humeral angle, less distinctly crenulate elytral striae, and slightly differently shaped female gonocoxites.

Description. Measurements. Length: 11.0 mm; width: 4.75 mm. Ratios. Width/length of pronotum: 1.79; width base/apex of pronotum: 1.48; width widest diameter/base of pronotum: 1.06; width of pronotum/width of head: 1.60; length/width of elytra: 1.56; width elytra/ pronotum: 1.25.

Colour. (Fig. 27) Black, lateral margin of pronotum piceous; mouth parts and antenna reddish-piceous, legs and lower surface dark piceous to black.



FIGS 1-9. Female gonocoxites (scale bars: 0.25 mm). 1. *Dendromigadops alticola* sp. nov. 2. *D. gloriosus* sp. nov. 3. *Nebriosoma fallax* Castelnau. 4. *Decogmus chalybaeus* Sloane. 5. *Calyptogonia atra atra* Sloane. 6. *Stichonotus leai* Sloane. 7. *S. piceus* Sloane. 8. *S. limbatus* Sloane. 9. *S. decoloratus* sp. nov.



FIGS 10-17. Male aedeagus and parameres (scale bars: 0.5 mm). 10. *Nebriosoma fallax* Castelnau. 11. *Decogmus chalybaeus* Sloane. 12. *Calyptogonia atra atra* Sloane. 13. *Calyptogonia lynetteae* sp. nov. 14. *Stichonotus leai* Sloane. 15. *S. piceus* Sloane. 16. *S. limbatus* Sloane. 17. *S. decoloratus* sp. nov.

Head. (Fig. 27) Medium sized; frons in middle with a very shallow, about horse-shoe impression; in middle of frons with some extremely fine, transverse wrinkles, orbits laterally rather rugose. Surface of head with very dense, distinct but extremely fine, isodiametric microreticulation, with scattered, fine punctures which are almost invisible within the dense microreticulation; surface moderately dull.

Pronotum. (Fig. 27) Very wide, widest about at basal third. Apex very deeply excised, anterior angles acute; lateral margin in convex throughout, also markedly incurved to middle posteriad, basal angle very small, dentiform. Apex distinctly margined, base not margined. Lateral margin rather wide, with a narrow sulcus in anterior half which suddenly widens posteriad and meets the oblique, linear lateral basal groove in a less than 90° angle. Disk depressed, median line distinct though shallow, neither reaching apex nor base. Anterior transverse sulcus shallow, posterior transverse sulcus deep but shortly interrupted in middle. Median basal groove linear and meeting the posterior transverse sulcus. The space between median and lateral basal grooves slightly convex, both grooves not connected. Surface with extremely fine and very superficial microreticulation which is composed of very irregularly transverse meshes, and with extremely fine, rather sparse punctures which are visible only under very high magnification. Surface moderately glossy.

Elytra. Rather elongate, parallel-sided, dorsal surface convex in middle, wide at humerus which is obtusely angulate. Lateral margin straight in basal three fifths, then evenly convex towards suture. Base not margined, marginal channel narrow throughout. Striae complete, rather deep, all striae distinctly crenulate in basal half, smooth in apical half, intervals gently convex. parascutellary pore located at meeting point of 2nd and 3rd striae, seta short. Disk asetose. 15 marginal punctures present, series slightly interrupted in middle, an additional puncture and seta at apex of 2nd stria, setae rather short. Microreticulation on intervals extremely fine and very superficial, composed of very dense, moderately transverse meshes, no distinct punctures visible. Surface rather glossy and slightly iridescent.

Lower surface. Prosternal process at apex carinate and produced. Metepisternum moderately elongate, c. 1.5 × as long as wide at apex. Lateral parts of prosternum and the proepimeron moderately coarsely punctate-rugose, the lateral parts of mesosternum and metasternum, the metepimeron, and the anterior, widened part of the elytral epipleura very coarsely punctate. Abdomen laterally irregularly and very coarsely punctate. Microreticulation very fine though distinct, composed of irregular, slightly transverse meshes.

Male genitalia. Unknown.

Female gonocoxites. (Fig. 2) As in genus diagnosis. Gonocoxite 1 more curved than in *D. alticola*, laterally below insertion of gonocoxite 2 not angulate, ventral surface in middle more sparsely setose and setae shorter; gonocoxite 2 longer and narrower than in *D. alticola*, less widened towards apex.

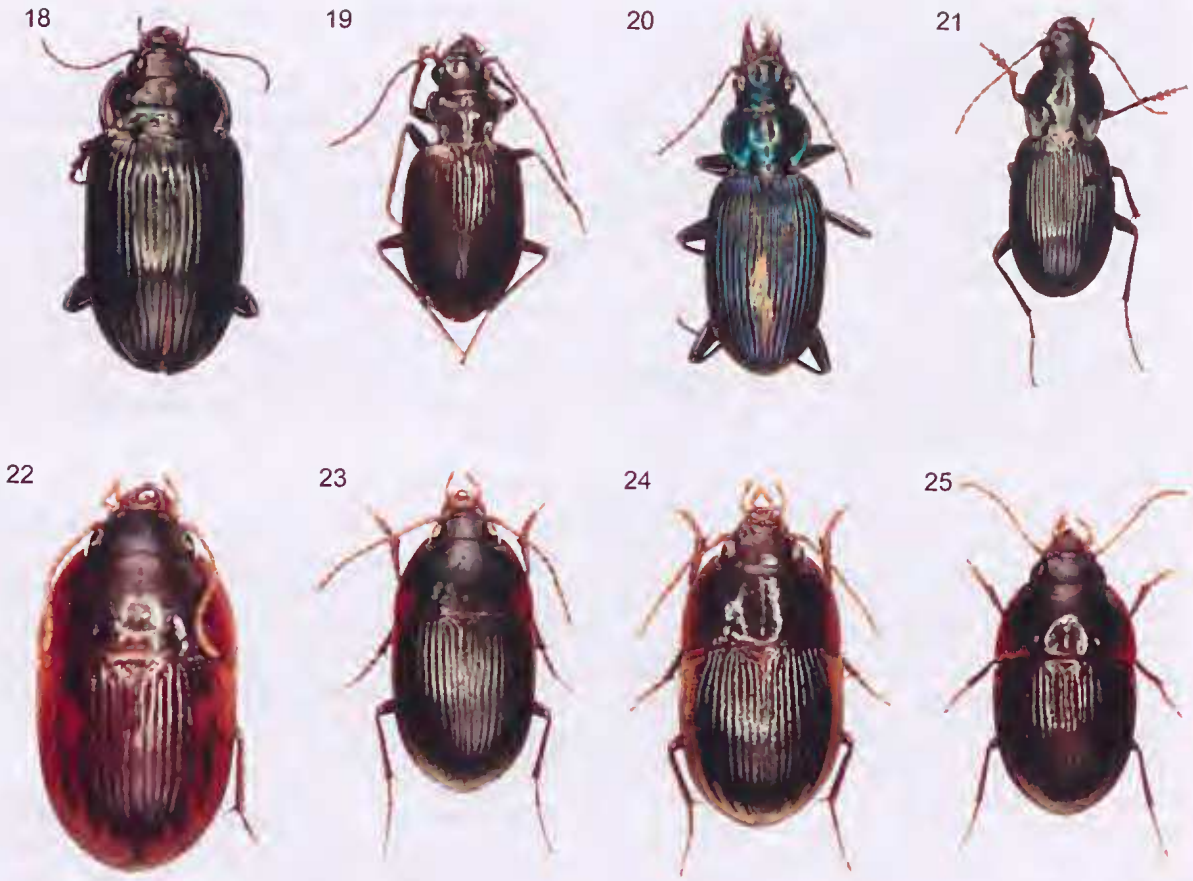
Variation. Unknown.

Distribution. Mountains slightly west of Brisbane, southeastern Queensland. Known only from type locality.

Collecting circumstances. The holotype was collected in a special canopy flight intercept trap (Basset 1988) designed and used by Yves Basset in a study of the canopy fauna of the tall rainforest tree *Argyrodendron actinophyllum* (F.M. Bailey) Edlin (Sterculiaceae) in rainforest at Mt Glorious which is 30 km NW of Brisbane (Basset 1991).

Key to species of *Dendromigadops* gen. nov.

1. Body size large, >12 mm; pronotum relatively wide, ratio width/length >1.90, towards apex more incurved, ratio width of base/width of apex >1.54, wider in relation to the head, ratio width of pronotum/width of head >1.75; lateral margin of pronotum wider; basal transverse sulcus and basal groove united by a transverse sulcus (Fig. 26); humeral angle of the elytra more acute; lateral elytral striae more distinctly crenulate; gonocoxite 1 latero-



FIGS 18-25. Habitus (body lengths in brackets). 18. *Dendromigadops alticola* sp. nov. (11.8 mm). 19. *Nebriosoma fallax* Castelnau (8.0 mm). 20. *Decognus chalybaeus* Sloane (12.4 mm). 21. *Calyptogonia atra atra* Sloane (11.8 mm). 22. *Stichonotus leai* Sloane (5.6 mm). 23. *S. piceus* Sloane (7.1 mm). 24. *S. limbatus* Sloane (5.9 mm). 25. *S. decoloratus* sp. nov. (5.6 mm).

apically excised, gonocoxite 2 shorter and less curved (Fig. 1). NE QLD... *D. alticola* sp. nov.

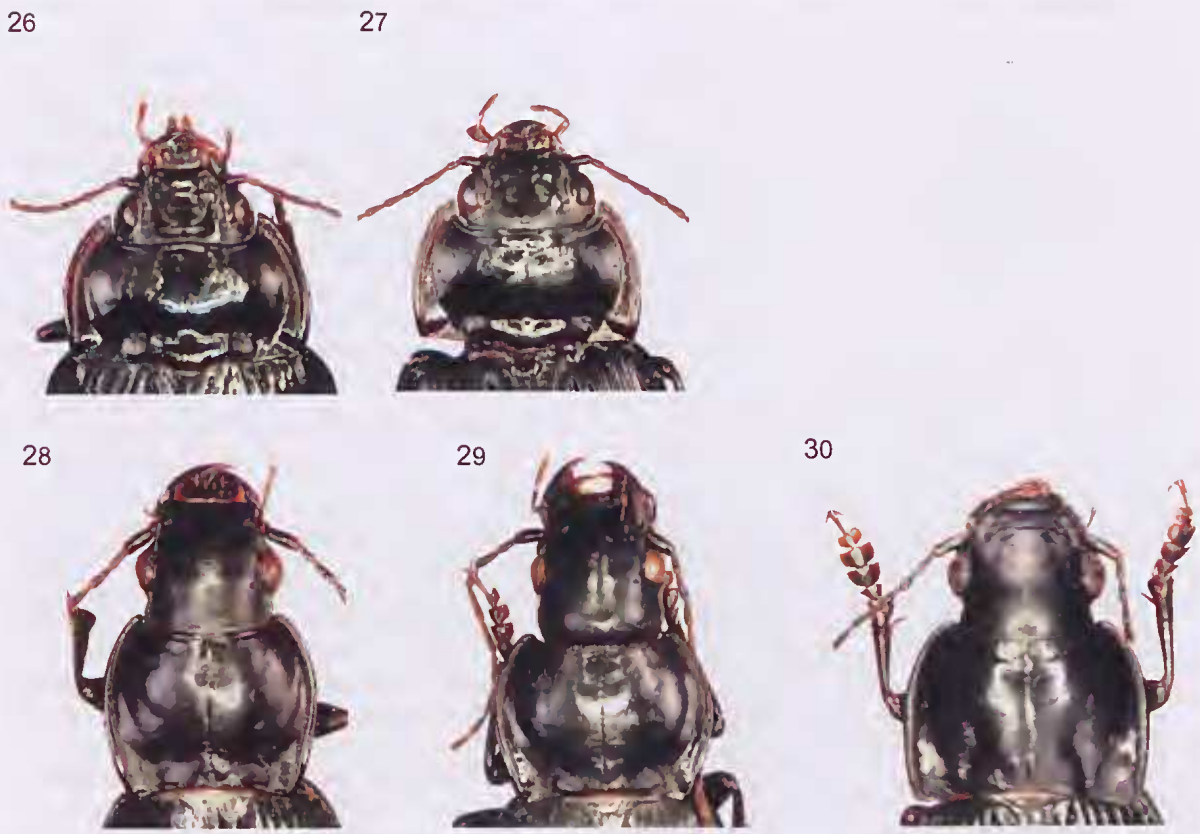
– Body size smaller, 11 mm; pronotum narrow, ratio width/length 1.79, towards apex less incurved, ratio width of base/width of apex 1.48, narrower in relation to the head, ratio width of pronotum/width of head 1.60; lateral margin of pronotum narrower; basal transverse sulcus and basal groove separated by a low boss (Fig. 27); humeral angle of the elytra less acute; lateral elytral striae less distinctly crenulate; gonocoxite 1 not latero-apically excised, gonocoxite 2 longer and more curved (Fig. 2). SE QLD ..... *D. gloriosus* sp. nov.

Nebriosoma Castelnau, 1867

Nebriosoma Castelnau, 1867: 93. – Castelnau 1868: 179; Sloane 1905: 703; 1915: 442; Csiki 1927: 443; Moore *et al.* 1987: 65, Lorenz 1998: 118.

Type species. *Nebriosoma fallax* Castelnau, 1867, by monotypy.

Diagnosis. Medium sized, rather short and wide, non metallic, piceous species; head wide, with large, laterally produced eye; prothorax clearly cordiform with barely excised apex and rectangular basal angles, pronotum with wide marginal sulcus; elytra rather short and wide but not oviform, striae shallow, 4th interval at basal fourth with a puncture; metathoracic wings reduced; aedeagus odd-shaped, very



FIGS 26-30. Head and Pronotum. 26. *Dendromigadops alticola* sp. nov. 27. *D. gloriosus* sp. nov. 28. *Calyptogonia atra atra* Sloane. 29. *Calyptogonia atra occidentalis* subsp. nov. 30. *Calyptogonia lynetteae* sp. nov.

curved, with a sclerotized fold at anterior part of the internal sac that bears two rows of short, stout, transverse setae at tip; both parameres markedly curved and coiled, both with dense fringe of setae at least in apical half of their lower surfaces; gonocoxites straight, rather stout, gonocoxite 1 with about 12 short, stout setae in apico-median half of lower surface; gonocoxite 2 large, obtusely triangular, with two very short nematiform setae at apex.

Distribution. A single species, known only from Kiama, southeastern NSW.

Nebriosoma fallax Castelnau, 1867
(Figs 3, 10, 19)

Nebriosoma fallax Castelnau, 1867: 93. – Castelnau 1868: 179; Sloane 1905: 703; 1915: 442; Csiki 1927: 443; Moore et al. 1987: 65, Lorenz 1998: 118 .

Note. Curiously, the two recorded specimens are both labeled 'Holotype', although both labels were added long after the description. However, both bear determination labels in Castelnau's handwriting. One specimen is a male and since it is better preserved, it is herein designated the lectotype. The female specimen becomes the paralectotype.

Material. LECTOTYPE (by present designation): ♂, Kiama/Type (red)/Nebriosoma Fallax Cast. (Castelnau's hand) / HOLOTYPE T-18464 Nebriosoma fallax Castelnau (red) (NMV). – PARALECTOTYPE: ♀, Nebriosoma Fallax Cast Kiama (Castelnau's hand) /NSW Kiama leg. Howitt Coll. CASTELNAU/ HOLOTYPUS Nebriosoma fallax Castelnau, 1867 (red) (MCSN).

No additional specimens recorded.

Diagnosis. As for genus.

Partial redescription. *Measurements.* Length: 7.3-8.0 mm; width: 3.35-3.5 mm. Ratios. Width/ length of pronotum: 1.46-1.48; width base/apex

of pronotum: 0.93-0.96; width widest diameter/ base of pronotum: 1.39-1.43; width of pronotum/ width of head: 1.25-1.26; length/width of elytra: 1.45-1.48; width elytra/pronotum: 1.55-1.57.

Male genitalia. (Fig. 10) Rather thickly sclerotized. Genital ring short and wide, oval. Aedeagus remarkably odd-shaped, moderately wide, rather stout, rather sinuate; lower surface remarkably concave; in middle on right side suddenly narrowed, apex short, convexly tapering, with obtusely convex tip. Orifice rather elongate, situated on the right side. Internal sac on the right side in the anterior part of the orifice with a large, sclerotized fold which at apex bears two rows of short, stout, at tip transverse setae. Both parameres large, markedly sinuate, coiled, and curved down at apex; left paramere wider than right one, angulate in middle of upper margin, with convexly triangular, bent down apex; basal part in middle less sclerotized, inner surface with a field of very short setae; apical half of lower surface and outer surface of apex with dense, uniseriate fringe of elongate setae; right paramere moderately narrow, with wide, obtusely rounded apex, lower surface in apical two thirds with two very dense fringes of very elongate hairs.

Female gonocoxites. (Fig. 3) Gonocoxite 1 elongate, straight, fairly wide, with a large hyaline area at upper lateral margin, with about 12 short, stout setae in apical median half of lower surface; gonocoxite 2 wide, short, straight, triangular, with a fold on the medio-dorsal surface, with obtuse apex which bears two very short nematiform seta originating close to apex.

Variation. Very little variation noted.

Distribution. Known only from the type locality Kiama, extreme southeastern NSW.

Collecting circumstances. Not recorded.

Decogmus Sloane, 1915

Decogmus Sloane 1915: 441 – Csiki 1927: 443; Moore et al. 1987: 65, Lorenz 1998: 118.

Type species. *Decogmus chalybaeus* Sloane, 1915, by monotypy.

Diagnosis. Moderately large, rather elongate, greenish species; head wide, with rather small but laterally produced eye and elongate, straight mandibles; prothorax slightly cordiform with barely excised apex and rectangular basal angles, pronotum with moderately wide marginal sulcus and very deep basal grooves; elytra rather elongate, incurved towards humerus, striae deep, smooth, 4th interval at basal fourth with a puncture; metathoracic wings fully developed; aedeagus rather large, straight, gently curved with a denticulate fold in the internal sac; both parameres densely setose at least in apical half; gonocoxite 1 with wide, convex apex; in apical part with many short and stout setae and the whole ventral surface and the median half of the dorsal surface with very dense, very elongate nematiform setae; gonocoxite 2 short, straight, inserted in middle of apex of gonocoxite 1, with one short nematiform seta originating from a circular pit at the very apex.

Distribution. A single species which is known from central eastern NSW.

Decogmus chalybaeus Sloane, 1915
(Figs 4, 11, 20)

Decogmus chalybaeus Sloane 1915: 441 – Csiki 1927: 443; Moore *et al.* 1987: 65, Lorenz 1998: 118.

Material. Holotype in ANIC, seen 2011.

New records. ♂, ♀, Carrai Plateau, via Kemsey, NSW. 14-15. iv. 1968 G. Monteith / *Decogmus chalybaeus* Sl. det. B. P. Moore'69 and '74 (ANIC, QM).

Diagnosis. As for genus.

Partial redescription. *Measurements.* Length: 12.4-13.0 mm; width: 4.6-4.7 mm. Ratios. Width/ length of pronotum: 1.32-1.35; width base/apex of pronotum: 1.20-1.22; width widest diameter/ base of pronotum: 1.27-1.28; width of pronotum/ width of head: 1.40-1.42; length/width of elytra: 1.68-1.73; width elytra/pronotum: 1.34-1.37.

Male genitalia. (Fig. 11) Rather thickly sclerotized. Genital ring short and wide, oval. Aedeagus moderately wide, rather stout, very slightly sinuate; lower surface gently concave throughout; apex wide, convexly tapering, with obtusely convex tip, slightly curved to left. Orifice rather elongate, situated on the right side. Internal sac in

the single available specimen completely everted; apparently simply structured, with one elongate, slightly sclerotized fold which is shortly but densely setose at apex. Both parameres large; left paramere much wider than right one, with triangular tip, obtuse, very slightly bent down apex, lower surface in apical half with dense, uniseriate fringe of elongate setae which at extreme apex are extremely elongate; right paramere rather narrow, very slightly curved, with obtusely tapering apex, lower surface in apical two thirds with two very dense fringes of very elongate hairs.

Female gonocoxites. (Fig. 4) Gonocoxites remarkably odd-shaped: gonocoxite 1 elongate, curved, with very wide, convex apex, with a large hyaline area on the latero-apical margin; at the margin of the hyaline area with several stout but elongate setae, and the whole apex with many short and stout setae; and the whole ventral surface and the median half of the dorsal surface with very dense, very elongate nematiform setae which are even longer at the median margin of the base; gonocoxite 2 stout, short, straight, almost parallel-sided, inserted in middle of apex of gonocoxite 1, with transverse apex which bears one rather short nematiform seta originating from a circular pit at the very apex.

Variation. Very little variation noted.

Distribution. Known from the type locality, Comboyne Plateau, and the Carrai Plateau (30.888°S, 152.267°E) which is 80 km N of the type locality , central eastern NSW.

Collecting circumstances. According to Sloane (1915) the types were found 'under the bark of a decaying tree fallen in the thick brush by the side of the road on the Bulli Mountain (north-western slope) near the village of Comboyne, in July'. According to the collector, the two specimens from Carrai Plateau were collected together under a log on the ground in temperate rainforest.

Calyptogonia Sloane, 1920

Calyptogonia Sloane 1920: 121 – Csiki 1927: 443; Moore *et al.* 1987: 65, Lorenz 1998: 118.

Type species. *Calyptogonia atra* Sloane, 1920, by monotypy.

Diagnosis. Moderately large, rather elongate, black species; head fairly wide, with eyes rather small and little produced laterally, and with short, curved mandibles; antenna pilose from apical fifth of 4th antennomere; surface of head with fine, isodiametric microreticulation; prothorax not cordiform with barely excised apex, basally incurved lateral margins, and obtuse basal angles; pronotum with narrow, posteriad widened marginal sulcus and shallow basal grooves; surface of pronotum with fine, isodiametric or very slightly transverse microreticulation; elytra moderately elongate, oval shaped, 3rd interval impilose; striae shallow, smooth; microreticulation varied; metathoracic wings reduced, metepisternum quadrate; aedeagus large, slightly sinuate, deeply curved with very large, axe-shaped apex; internal sac with a large, sclerotized fold in the posterior part of the orifice; parameres very dissimilar, the right one densely setose in apical two thirds, the left one acute at tip and more sparsely setose; gonocoxites straight, elongate, gonocoxite 1 very densely setose; gonocoxite 2 small, parallel sided, situated at apex of gonocoxite 1, with four short nematiform setae at apex.

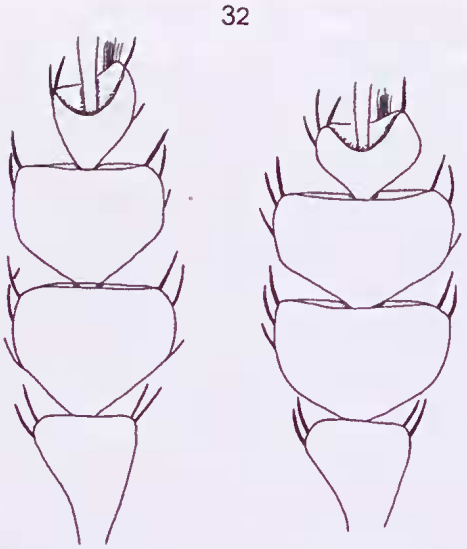
Distribution. Two species and one additional subspecies which occur in western and central Tasmania.

Calyptogonia atra Sloane, 1920

Calyptogonia atra Sloane 1920: 121 – Csiki 1927: 443; Moore *et al.* 1987: 65, Lorenz 1998: 118, 2005.

Note. This species is known from two areas in Tasmania: Cradle Mt National Park and environments in the Central Highland and Mt Weld in south-western Tasmania. Both populations differ slightly in width of prothorax and length of elytra and therefore also in the ratios of pronotum/head and pronotum/elytra. The male and female genitalia, however, are quite similarly shaped. Because of these morphological differences and the separation of both populations by a wide corridor of rather dry lowland running between their ranges these are provisionally described as subspecies.

Diagnosis. Distinguished from *Calyptogonia lynetteae* sp. nov. by narrower pronotum with narrower base, laterad less projected eye with



FIGS 31-32. Male protarsus. 31. *Calyptogonia atra atra* Sloane. 32. *C. lynetteae* sp. nov.

longer orbit, isodiametric microreticulation of the elytra, narrower and longer 2nd–4th tarsomeres of the male protarsus, and sinuate upper margin of the aedeagus.

Calyptogonia atra atra Sloane, 1920
(Figs 5, 12, 21, 28, 31)

Material. LECTOTYPE: ♂, Cradle Mt T.H.J.C. 1.18 T/Type./*Calyptogonia atra* Sl. Id. by T.G. Sloane/ Lectoholo-C. *ater* Sl. PJD (*red*)/J. 10829 *Calyptogonia atra* Sl. Tasmania, TYPE (SAMA). – PARALECTOTYPES: 1 ♀, Cradle Mt, T.H.J. C. 1.18 / Co-Type. / *Calyptogonia atra* Sl. Id. by T.G. Sloane (SAMA); ♂, Cradle Mt Tasmania Carter & Lea / Co-type / 19686 *Calyptogonia atra* Sl. Tasmania Cotype (SAMA); ♂, Cradle Mt Tasmania Carter & Lea / Co-type / *Calyptogonia atra* Sl. Id. by T.G. Sloane (SAMA); ♂, Cradle Mt Tasmania Carter & Lea / Co-type / Cotype (*green*) / Tribe Migadopini *Calyptogonia* n. g. (1918) *ater* Sl. (1918) Id. by T. G. Sloane / 2823 Paratype (*blue*) (NMV 2011-14L); ♂, Cradle Mt, Tasmania, Carter & Lea / Co-type / Cotype (*green*) /H.J. Carter Coll. P. 20.4.22 / 2824 Paratype (*blue*) (NMV 2011-14L); ♂, Cradle Mt, T.H.J.C. 1.18 / Co-type / Cotype (*green*) / H. J. Carter Coll. P. 20.4.22 / 2825 Paratype (*blue*) (NMV 2011-14L); ♂, Cradle Mt, Tasmania, Carter & Lea / Cotype 2568 (*blue*) / F. E. Wilson Collection (NMV 2011-14L); 1 (?sex, defect, head and prothorax missing, abdomen eaten by dermestid larva), Tasmania, H.J.C. 1918/Co-Type / *Calyptogonia ater* Sl. Id. by T. G. Sloane/PARATYPE (*blue*) (ANIC); ♂ (abdomen eaten), Co-type (*yellow*) /Australia 1921. 125/Cradle Mt T.H.J.C. 1.18/ *Calyptogonia atra* Sl. Id. by T. G. Sloane (NHM).

New records. ♂, ♀, Tasmania Hartnett 2.ii.77 J. Sedlacek (ANIC); ♀, AUSTRALIA: Waldheim Tas. 20.iii.77 B. P. Moore / *Calyptogonia ater* Sl. det. B. P. Moore'77 (ANIC); ♀, AUSTRALIA, C-TASMANIA Lake St. Clair Narcissus Bay 750 m, 27 I 1998 (Lok 11/52) Lars Hendrich leg/Coll (CBM); ♀, Cradle Mt. T H J. C. 1.18 / *Calyptogonia ater* Sl. (ANIC) ; ♀, Tas.., Lake Sydney 690 m 2 Feb. 1994 R. Mesibov 55GDN686070 / Databased 201534 PBMcQ (FTIC); ♂, Dorrigo, NSW Jan. 1931. C. Oke/*Calyptogonia atra* Sloane Tasmanian sp. !! Det. B.P. Moore'61 (NMV).

Diagnosis. Distinguished from *Calyptogonia atra occidentalis* subsp. nov. by narrower pronotum and slightly longer elytra.

Partial redescription. *Measurements* (ratios of a specimen with exceptionally wide pronotum and narrow elytra in brackets). Length: 11.6-12.6 mm; width: 4.3-4.7 mm. Ratios: Width/length of pronotum: 1.26-1.34 (1.37); width base/apex of pronotum: 1.17-1.22; width widest diameter/base of pronotum: 1.26-1.33; width of pronotum/width of head: 1.40-1.45; length/width of elytra: 1.58-1.61; width elytra/pronotum: (1.13)1.29-1.38.

Legs. (Fig. 31) 2nd–4th tarsomeres of male protarsus moderately wide.

Male genitalia. (Fig. 12) Very heavily sclerotized. Genital ring short and wide, oval, very thickly sclerotized. Aedeagus large, narrow, markedly curved; lower surface in apical two thirds very concave; apex large, somewhat axe-shaped, tip directed down. Upper margin near apex distinctly incised. Orifice situated completely on the right side, oval. Internal sac with several, thickly sclerotized folds. Both parameres large and wide, markedly hollowed on the inner surface; left paramere with acute, slightly upturned apex, with many moderately elongate setae at apical third of lower surface and some setae on upper surface immediately at apex; right paramere longer than left, slightly boomerang-shaped, with wide, slightly rounded apex, apex with moderately short setae, lower surface in apical three fifth with very dense, double fringe of elongate hairs.

Female gonocoxites. (Fig. 5) Gonocoxite 1 elongate, moderately narrow, widened towards

apex, medially at the base with a hook-shaped plate, with a large hyaline area on the latero-apical margin; with many short and stout, at apex obtuse, setae at the median and lateral apical margins, and the whole ventral surface and the median half of the dorsal surface with very dense, very elongate nematiform setae; gonocoxite 2 narrow, rather short, straight, almost parallel-sided, inserted at apex of gonocoxite 1, with transverse apex which bears three or four moderately elongate nematiform setae originating from a circular pit at the very apex.

Variation. Generally little variation noted. One old specimen from Cradle Mt, however, has a slightly wider pronotum than usual (ratio width/length 1.37) and remarkably narrow and less oviform elytra, hence the ratio width of elytra/width of pronotum is exceptionally small (1.13). Therefore, this specimen is only tentatively ascribed to the nominate subspecies.

Distribution. Central Tasmania. The single 'Dorrigo' specimen is certainly wrongly labeled.

Collecting circumstances. Not recorded, but probably collected at rather high altitude of 800 m or even higher.

Calyptogonia atra occidentalis subsp. nov.
(Fig. 29)

Material. HOLOTYPE: ♂, Tas.: Mt Weld, 146.58E x 43.01S Warra-Mt Weld, alt. transect Pitfall trap WD1300P45L N. Doran & R. Bashford, 18 Dec 2001 FT5823 (FTIC). – PARATYPES: ♂, ♀, same data (FTIC); ♂, Tas.: Mt Weld, 146.58E x 43.01S Warra-Mt, Weld alt. transect Pitfall trap WD1300P25L N. Doran & R. Bashford, 22 Jan 2001 FT5912 (FTIC); ♂, 2♀♀, Tas.: Mt Weld 146.59E x 43.01S Warra-Mt. Weld, alt. transect Pitfall trap WD1100P45L N. Doran & R. Bashford, 22 Jan 2001 FT5901 (FTIC); ♂, Tas.: Mt Weld, 146.58E x 43.01S Warra-Mt Weld, alt. transect Pitfall trap WD1300P5L N. Doran & R. Bashford, 26 Feb 2001 FT97 (FTIC); 2♂♂, ♀, Tas.: Mt Weld 146.58E x 43.01S Warra-Mt Weld alt. transect Pitfall trap WD1300P45U N. Doran & R. Bashford, 22 Jan 2001 FT5916 (FTIC); 2♂♂, Tas.: Mt Weld, 146.60E x 43.00S Warra-Mt Weld, alt. transect Pitfall trap WD900P45L N. Doran & R. Bashford, 26 Feb 2001 FT5978 (FTIC); ♀, Tas.: Mt Weld, 146.59E x 43.01S Warra-Mt Weld, alt. transect Pitfall trap WD1100P45L N. Doran & R. Bashford, 18 Dec 2001 FT5811 (FTIC); ♀, Tas.: Mt Weld, 146.58E x 43.01S Warra-Mt Weld, alt. transect Pitfall trap WD1200P5U N. Doran & R. Bashford, 26 Feb 2001 FT5998 (FTIC); ♀, Tas.: Mt Weld, 146.60E x 43.00S Warra-Mt Weld, alt. transect Pitfall trap WD900P45U N. Doran & R. Bashford, 22 Jan 2001 FT5891 (FTIC); ♀, Tas.: Mt Weld, 146.58E x 43.01S Warra-Mt Weld, alt. transect Pitfall trap WD1300P5L N. Doran & R. Bashford, 22 Jan 2001 FT5911 (FTIC); ♀, Tas.: Mt Weld, 146.58E x 43.01S Warra-Mt Weld, alt. transect Pitfall trap WD1300P5U N. Doran & R. Bashford, 22 Jan 2001 FT5914 (FTIC); ♀, Tas.: Mt Weld, 146.59E x 43.01S Warra-Mt Weld, alt. transect Pitfall trap WD1100P25U N. Doran & R. Bashford, 22 Jan 2001 FT5903 (FTIC); ♀, Tas.: Mt Weld, 146.58E x 43.01S Warra-Mt Weld, alt. transect Pitfall trap WD1300P5L N. Doran & R. Bashford, 18 Dec 2001 FT5821 (FTIC); ♀, Tas.: Mt Weld, 146.58E x 43.01S Warra-Mt Weld, alt. transect Pitfall trap WD1200P45L N. Doran & R. Bashford, 22 Jan 2001 FT5907 (FTIC); 2♀♀, Tas.: Mt Weld, 146.58E x 43.01S Warra-Mt Weld, alt. transect Pitfall trap WD1200P5L N. Doran & R. Bashford 22 Jan 2001 FT5905 (FTIC); ♂, Tas.: Mt Weld, 146.59E x 43.01S Warra-Mt Weld, alt. transect Pitfall trap WD1100P45L N. Doran & R. Bashford, 26 Feb 2001 FT87 (CBM); ♂, Tas.: Mt Weld, 146.60E x 43.00S Warra-Mt Weld, alt. transect Pitfall trap WD900P45U N. Doran & R. Bashford, 26 Feb 2001 FT77 (CBM); ♀, Tas.: Mt Weld, 146.58E x 43.01S Warra-Mt Weld, alt. transect Pitfall trap WD1200P45U N. Doran & R. Bashford 26 Feb 2001 FT276 (CBM); ♂, Tas.: Mt Weld, 146.58E x 43.01S Warra-Mt Weld, alt. transect Pitfall trap WD1300P25U N. Doran & R. Bashford, 26 Feb 2001 FT6005 (FTIC).

Etymology. The species name refers to the occurrence of the subspecies in western Tasmania.

Diagnosis. Distinguished from *Calyptogonia atra atra* Sloane by wider pronotum and slightly shorter elytra.

Description. *Measurements.* Length: 11.8-13.2 mm; width: 4.55-5.0 mm. Ratios. Width/length of pronotum: 1.39-1.43; width base/apex of pronotum: 1.19-1.22; width widest diameter/base of pronotum: 1.29-1.33; width of pronotum/width of head: 1.58-1.60; length/width of elytra: 1.52-1.56; width elytra/pronotum: 1.21-1.25.

Colour. Similar to that of the nominate subspecies.

Head. (Figs 29) Rather similar to those of the nominate subspecies.

Pronotum. (Fig. 29) Fairly similar to those of the nominate subspecies, but wider and also wider in relation to the head and the elytra.

Elytra. Surface structure similar to those of the nominate subspecies, but elytra slightly shorter.

Lower surface. Similar to that of the nominate subspecies.

Legs. Similar to those of the nominate subspecies.

Male genitalia. Rather similar to those of the nominate subspecies.

Female gonocoxites. Similar to those of the nominate subspecies.

Variation. Very little variation noted.

Distribution. South-western Tasmania, recorded only from the area around Mt. Weld.

Collecting circumstances. All specimens were sampled in pitfall traps in montane rain forest.

Calyptogonia lynetteae sp. nov.
(Figs 13, 30, 32)

Calyptogonia atra Sloane 1920: 121 (part).

Material. HOLOTYPE: ♂, Magnet Tasmania/Lea /Tribe Migadopini Gen. ? sp. nov. Id by T. G. Sloane / PARATYPE *Calyptogonia ater* Sl. (*blue*) (ANIC) (paratype label written by Darlington!). – PARATYPE: ♂, CP890910 NW Tas., Animal Creek. 740 m. 24 JAN. 1992 A. Mesibov / Databased 201635 PBMcQ (FTIC).

Etymology. The species name is a patronym in honour of Lynette Forster of Tasmania Forestry Insect Collection, in gratitude for her kind assistance to me in many respects during my visit at that collection and because she independently recognised this as a new species.

Diagnosis. Distinguished from *Calyptogonia atra* Sloane by wider pronotum with much wider base, laterad more projected eye with shorter orbit, very transverse microreticulation of the elytra, wider and shorter 2nd–4th tarsomeres of male protarsus, and not sinuate upper margin of the aedeagus.

Description. Measurements. Length: 10.7-11.2 mm; width: 4.15-4.25 mm. Ratios. Width/length of pronotum: 1.51-1.54; width base/apex of pronotum: 1.39-1.47; width widest diameter/base of pronotum: 1.09-1.15; width of pronotum/width of head: 1.49-1.54; length/width of elytra: 1.51; width elytra/pronotum: 1.15-1.19.

Colour. (Fig. 30) Black, only tarsi and apical antennomeres piceous.

Head. (Fig. 30) Of average size. Labrum slightly excised at apex. Eye slightly larger than in *C. atra*, laterad rather projected, orbit very short, c. 1/10 of length of eye.

Pronotum. (Fig. 30) Wide, at base much wider than at apex; lateral border evenly convex; lateral margin moderately wide, and of almost equal width throughout. Marginal sulcus shallow, widened and explanate behind middle. Both, apex and base gently sinuate. Apical angles slightly produced, basal angles rectangular but obtuse. Median line comparatively deep. Both transverse sulci very shallow. Basal impressions rather shallow, the inner one rather narrow, elongate, and sinuate.

Elytra. Comparatively short, with rather wide base, lateral borders evenly convex to suture. Striae complete, deep, impunctate, intervals moderately convex. Parascutellary pore at junction of 2nd and 3rd stria. Marginal series consisting of 13-14 punctures which are quite regularly arranged. Microreticulation composed of very fine, rather superficial, very transverse meshes and lines; surface rather iridescent.

Lower surface. With fine, isodiametric to slightly transverse microreticulation. Metepisternum quadrate. Terminal sternum in male bisetose.

Legs. (Fig. 32) Of average size. 2nd–4th tarsomeres of male protarsus very wide and densely squamose.

Male genitalia. (Fig. 13) Very heavily sclerotized. Genital ring short and wide, oval, very heavily sclerotized. Aedeagus large, narrow, markedly curved; lower surface in apical two thirds very concave; apex large, somewhat axe-shaped, tip directed down. Upper margin evenly convex. Orifice situated completely on the right side, oval. Internal sac with several, thickly sclerotized folds. Both parameres large and wide, markedly hollowed on the inner surface; left paramere with acute, slightly down-curved, hyaline apex, with several moderately elongate setae at apical part of upper surface; right paramere longer than left, slightly boomerang-shaped, with wide, evenly rounded apex, apex with moderately short hairs, lower surface in apical three fifths with very dense, double fringe of elongate hairs.

TABLE 1. Measurements and ratios of the species of *Calyptogonia* sloane, 1920. N = number of specimens measured; body length in mm; w/l pr = ratio width/length of pronotum; b/a pr = ratio width of base/ width of apex of pronotum; dia/b pr = ratio widest diameter/width of base of pronotum; pr/h = ratio width of pronotum/width of head; l/w el = ratio length/width of elytra; el/pr = ratio width of elytra/width of pronotum.

	N	body	w/l	b/a	dia/b	pr/h	l/w	el/pr
		length	pr	pr	pr		el	
atra atra	12	11.6-12.6	1.26-1.34	1.17-1.22	1.26-1.33	1.40-1.45	1.58-1.61	1.29-1.38
atra occidentalis	8	11.8-13.2	1.39-1.43	1.19-1.22	1.29-1.33	1.58-1.60	1.52-1.56	1.21-1.25
lynetteae	2	10.7-11.2	1.51-1.54	1.39-1.47	1.09-1.15	1.49-1.54	1.51	1.15-1.19

Female gonocoxites. Unknown.

Variation. The paratype has a wider pronotum with a relatively wider base.

Distribution. North-western Tasmania.

Collecting circumstances. Not recorded.

KEY TO SPECIES OF *CALYPTOGONIA*

1. Pronotum very wide, ratio width/length >1.50, base much wider than apex, ratio width of base/ width of apex >1.39; eye more convex, orbit shorter (Fig. 30); 2nd-4th tarsomeres of male protarsus wider and shorter (Fig. 32); microreticulation of elytra composed of very transverse meshes and lines, surface slightly iridescent; upper margin of aedeagus not sinuate (Fig. 13). NW Tas. . . . . *lynetteae* sp. nov.
– Pronotum narrower, ratio width/length >1.43, base comparatively narrower, ratio width of base/ width of apex <1.22; eye less convex, orbit longer (Figs 28, 29); 2nd-4th tarsomeres of male protarsus narrower and longer (Fig. 31); microreticulation of elytra isodiametric, surface dull; upper margin of aedeagus distinctly sinuate (Fig. 12). C, SW Tas. . . . . 2.

2. Pronotum narrower, ratio width/length < 1.34, and narrower in comparison to the head, ratio width of pronotum/width of head < 1.45 (Fig. 28); elytra slightly longer, ratio length/width 1.58-1.61. C Tas . . . . . *atra atra* Sloane, 1920
– Pronotum wider, ratio width/length >1.39, and wider in comparison to the head, ratio width of pronotum/width of head >1.58 (Fig. 29); elytra slightly shorter, ratio length/width 1.52-1.56. SW Tas . . . . . *atra occidentalis* subsp. nov.

Stichonotus Sloane, 1910

Stichonotus Sloane, 1910: 378. – Sloane 1915: 439; 1920: 122; Csiki 1927: 443; Moore et al. 1987: 65, Lorenz 1998: 118.

Type species. *Stichonotus leai* Sloane, 1910, by monotypy.

Diagnosis. Small, oval-shaped, more or less brightly coloured species with wide, at apex deeply excised pronotum and far produced apical angles; head deeply imbedded into the prothorax; eye of normal size; elytra short, oviform, impunctate; metathoracic wings reduced; aedeagus very narrow and remarkably elongate, conspicuously curved at least in basal part; right paramere also narrow and elongate, curved, densely setose in apical third; left paramere stouter than right one, asetose or sparsely setose at apex; gonocoxites narrow and elongate, gonocoxite 1 more or less densely setose, gonocoxite 2 small, narrow, straight, with a single short nematiform seta at apex.

Distribution. Four species, three of which occur in Tasmania, one in southern Victoria.

Note. The three described species of *Stichonotus* are rather similar in shape and structure. The key given by Sloane (1915: 439) is still reasonably useful, but not all specimens, in particular of the two recorded Tasmanian species, do fit the characters enumerated in the key. Therefore colleagues of Tasmanian Forestry requested

that I examine the genitalia to achieve additional distinguishing characters. Hence the male genitalia and female gonocoxites of all species were examined and are figured. This examination revealed an additional species from Tasmania which is also different in some characters of external morphology. Therefore a new key to all species is provided.

Stichonotus leai Sloane, 1910
(Figs 6, 14, 22)

Stichonotus leai Sloane, 1910: 379. – Sloane 1915: 439; 1920: 122; Csiki 1927: 443; Moore *et al.* 1987: 65, Lorenz 1998: 118.

Material. HOLOTYPE: ♀, *Stichonotus leai*, Sl. Type / Magnet, Tas. Rec. from A.M. Lea / Holotype *Stichonotus leai* Sl. PJD / ANIC Database 25 054362 (ANIC).

New Records. (4 ex.) ♂, 42.06S 146.10E Lake St. Clair 750 m Tas. 25-27 Jan. 1980 Lawrence & Weir / Berlesate ANIC 664 litter under tree ferns & *Nothofagus* (ANIC); ♀, Waratah Tas: Lea & Carter / H. J. Carter Coll. P. 20.4.22 / *Stichonotus leai* Sl. (1910) Id. by T.G. Sloane (NMV 3476); ♂, Waratah Tas Mar.'57 Darlingtons / *Stichonotus leai* Sl. Darlington 63 (NMV 3477); ♀, Magnet Tas./1155 S *Stichonotus oodiformis* Sl. Tas. (SAMA 25-033391).

Note. This species includes all those Tasmanian specimens that are smaller and shorter than *S. piceus* Sloane and possess a wide, uninterrupted, pale elytral margin. It is unclear why this was done, as Sloane's description explicitly states that the 7th interstice (which is the 8th when the first interval is included) is dark over most of its length. This is not the case in most specimens determined as *S. leai*. These specimens are described as the new species *S. decoloratus* in the present paper.

Diagnosis. A rather small and short, distinctly coloured species, with a wide, reddish margin of the elytra which bears a distinct, longitudinal, dark stripe on the 8th interval. Further distinguished from all small, short species by the markedly curved apex of the aedeagus and the strongly curved basal part of the right paramere. Further distinguished from *S. limbatus* Sloane by the margin of the elytra not crenulate, and from the most similar *S. decoloratus* by slightly longer elytra and much larger and more regularly curved aedeagus.

Partial redescription. *Measurements.* Length: 5.4-5.9 mm; width: 2.7-2.9 mm. Ratios. Width/length of pronotum: 1.92-1.97; width base/apex of pronotum: 1.74-1.82; width widest diameter/base of pronotum: 1.01-1.012; width of pronotum/width of head: 1.80-1.86; length/width of elytra: 1.19-1.21; width elytra/pronotum: 0.99-1.01.

Colour. (Fig. 22) Conspicuous. Head and pronotum more or less dark brown, palpi, antennae, and legs reddish. Pronotum with wide pale reddish margin which is widened towards base. Elytra more or less dark brown, this colour covers the six median intervals, at base even the eight median ones; lateral margin from 7th interval contrastingly yellow or pale reddish, but the 8th interval over most of its length again contrastingly dark. Apex widely pale, except the sutural interval.

Male genitalia. (Fig. 14) Genital ring short and wide, oval. Aedeagus very narrow and elongate, barely sinuate except in apical part; lower surface regularly and markedly concave throughout; apex rather narrow, obtuse, very much curved to left. Orifice elongate, largely situated on the right side. Internal sac very simply structured, with one elongate, slightly sclerotized fold. Both parameres large; left paramere shorter than right one, moderately wide, markedly boomerang-shaped, with narrow, obtusely triangular apex, lower surface with a few moderately elongate setae immediately at apex; right paramere longer than left, rather narrow, in basal third extremely curved, in apical two thirds straight, with obtuse, slightly tapering apex, lower surface in apical half with two very dense fringes of extremely elongate hairs.

Female gonocoxites. (Fig. 6) Gonocoxite 1 elongate, moderately wide, the complete lower surface and part of the upper surface very densely setose with elongate nematiform setae; apical part and along the border of the hyaline area with several short and stout setae; gonocoxite 2 narrow, short, elongate, with obtuse apex which bears one short nematiform seta originating close to apex from a circular pit.

Variation. Little variation noted. In particular the colouration is very characteristic and barely varied.

Distribution. North-western and central Tasmania.

Collecting circumstances. Specimens were collected by Berlese extraction in 'litter under tree ferns & *Nothofagus*' at rather high altitude.

Stichonotus piceus Sloane, 1915
(Figs 7, 15, 23)

Stichonotus piceus Sloane 1915: 439, 440. – Sloane 1920: 122; Csiki 1927: 443; Moore *et al.* 1987: 65, Lorenz 1998: 118.

Material. HOLOTYPE: in ANIC, seen 2011.

New records. Many specimens from central and western Tasmania.

Diagnosis. A comparatively large, predominantly dark species, easily distinguished from the three other species by longer elytra, comparatively wider base of the pronotum in relation to apex, and the distinct, isodiametric microreticulation of the elytra which give these a somewhat dull appearance. Further distinguished by the less curved aedeagus and the stout left paramere which is impilose at apex.

Partial redescription. *Measurements.* Length: 6.5-8.2 mm; width: 3.0-3.85 mm. Ratios. Width/length of pronotum: 1.78-1.85; width base/apex of pronotum: 2.04-2.15; width widest diameter/base of pronotum: 1.0; width of pronotum/width of head: 2.18-2.26; length/width of elytra: 1.30-1.33; width elytra pronotum: 1.01-1.03.

Colour. (Fig. 23) Head and pronotum dark piceous to almost black, palpi, antennae, and legs dark reddish. Pronotum with inconspicuous, moderately wide dark reddish margin which is widened towards base. Elytra dark piceous to black, with or without an inconspicuous, narrow, dark reddish margin which is widened in only apical fourth.

Male genitalia. (Fig. 15) Genital ring short and wide, oval. Aedeagus very narrow and elongate, very slightly sinuate; lower surface in basal half very concave, in apical half almost straight; apex narrow, asymmetrically situated on the right side, slightly curved. Orifice elongate, largely situated on the right side. Internal sac very simply structured, with one elongate, slightly sclerotized fold. Both parameres large; left paramere short and wide, with triangular, slightly obtuse apex, without any setae; right paramere longer than left, narrow, markedly curved, with triangularly tapering apex, lower surface with two very dense fringes of elongate hairs in apical third.

Female gonocoxites. (Fig. 7) Gonocoxite 1 elongate, moderately wide, the complete lower surface very densely setose with rather short nematiform setae; gonocoxite 2 narrow, short, elongate but slightly triangular, with obtuse apex which bears one short nematiform seta originating close to apex from a circular pit.

Variation. Considerable variation is noted in body size and in degree of light colour of the margins of pronotum and elytra, less so in shape of pronotum and elytra.

Distribution. Widely distributed in western and central Tasmania.

Collecting circumstances. A common, ground living species which occurs in open to dense forest. According to information kindly received from Lynette Forster and Simon Grove of Forestry Tasmania, this species is most common in somewhat disturbed environments.

Stichonotus limbatus Sloane, 1915
(Figs 8, 16, 24)

Stichonotus limbatus Sloane 1915: 439, 440. – Csiki 1927: 443; Moore et al. 1987: 65, Lorenz 1998: 118.

Material. SYNTYPES: 1 (?sex, damaged, head and prothorax missing, abdomen eaten by dermestid larva), Beech Forest Vict. J.E.D. / *Stichonotus limbatus* Sl. cotype /PARATYPE (*blue*) (ANIC); other syntypes in NMV, seen 2007.

New records. (16 ex.) Mt. Sabine Otway Ranges, Vic 22-23.i.1967, G. Monteith (CBM, QM); Lorne Vic 25.i.59 B. P. Moore (ANIC); Beech Forest Vict, 13.ii.60 B.P. Moore (ANIC, CBM); Beech Forest Vic, 11 – 19 Jan. 1932 F.E. Wilson (QM); 38.47S 143.37E Vic Otway NP Ellliot R. 5.5 km W Marengo. 80 m, 828, 8 Feb 1987 A. Newton & M. Thayer (ANIC); 38.43S 143.35E Vic Otway NP 390m Binn Rd. 4.3km N.Cape Horn 808, 25 Jan–8 Feb 1987 A. Newton & M. Thayer (ANIC);

38.39S 143.42E VIC Haines Junct. 525 m, 1.9 km W.on Turtons Track. 809 25Jan-8Feb 1987 A. Newton & M. Thayer (ANIC).

Diagnosis. A rather small and short, distinctly coloured species, distinguished from other two small, short species by crenulate margin of the elytra and the unisetose apex of the left paramere; further from *S. leai* by more curved aedeagus and right paramere; and from *S. decoloratus* by straight apex of the aedeagus and right paramere far less curved basally.

Partial redescription. *Measurements.* Length: 5.9-6.8 mm; width: 2.9-3.15 mm. Ratios. Width/length of pronotum: 1.93-2.0; width base/apex of pronotum: 1.76-1.80; width widest diameter/base of pronotum: 1.0-1.01; width of pronotum/width of head: 1.86-1.90; length/width of elytra: 1.20-1.28; width elytra/pronotum: 1.01-1.03.

Colour. (Fig. 24) Rather conspicuously contrasting pattern. Head and pronotum piceous to almost black, palpi and antennae reddish, legs brown to piceous. Pronotum with rather distinct, pale reddish margin which in anterior half is narrow but is widened towards base. Elytra piceous to almost black, with narrow but conspicuous reddish margin which extends from the lateral half of 9th interval to the margin, but is widened in apical fifth or sixth. At apex only the sutural interval is dark.

Male genitalia. (Fig. 16) Genital ring short and wide, oval. Aedeagus very narrow and elongate, straight, slightly widened near apex; lower surface very concave throughout, in apical third even slightly bent down; apex rather wide, triangularly tapering, striaght. Orifice elongate, largely situated on the right side. Internal sac very simply structured, with one elongate, slightly sclerotized fold. Both parameres large but comparatively narrow; left paramere shorter than right one, moderately wide, with narrow, triangular, slightly up-curved apex, with a single. fairly elongate seta at apex; right paramere longer than left, very narrow, markedly curved, even slightly boomerang-shaped, with narrow, triangularly tapering apex, lower surface in apical third with two very dense fringes of extremely elongate hairs.

Female gonocoxites. (Fig. 8) Gonocoxite 1 elongate, rather narrow, with a hyaline area at the apical-lateral part of the ventral surface; at the border of the hyaline area with a series of stout but elongate setae, the medio-apical margin with some shorter, stout setae; the whole lateral and ventral surfaces densely clothed with elongate nematiform setae; gonocoxite 2 narrow, moderately short, straight, almost parallel-sided, with slightly rounded apex which bears one short nematiform seta originating close to apex from a circular pit.

Variation. Little variation noted in relative length of the elytra.

Distribution. Recorded only from the Otway Ranges in south-western Victoria.

Collecting circumstances. A ground living species which occurs in closed forest. Some specimens were collected in 'wet sclero. forest in leaf and log litter'.

Stichonotus decoloratus sp. nov.
(Figs 9, 17, 25)

Material. HOLOTYPE: ♂, AUSTRALIA: 12 km NE of Corinna Tas. 22.iii.77 B.P. Moore / *Stichonotus leai* Sl. det. B.P. Moore'77 (ANIC). – PARATYPES: ♂, AUSTRALIA: Waldheim Tas. 20.iii.77 B.P. Moore (ANIC); ♂, SW Tasmania, Lower Gordon R. 42.48.5S 145.51E 42.48.5S 145.51E Howard, Hill... / H.E.C. Survey 5L. 720 Mar 1977 litter (ANIC); ♂, SW Tasmania Lower Gordon R. 42.31-56S 145.42-56E Howard, Hill... / H.E.C. Survey 5R. 500 Mar 1977 litter / *Stichonotus leai* Sl. det. B.P. Moore'77 (CBM); ♀, SW Tasmania Lower Gordon R. 42.31-56S 145.42-56E Howard, Hill... /H.E.C. Survey 5R. 500 Mar 1977 litter (ANIC); ♂, SW Tasmania Lower Gordon R. 42.43 S 45 145.43 E50 Howard, Hill... / H.E.C. Survey 2R. 860 12R 850 litter/ *Stichonotus leai* Sl. det. B.P. Moore'77 (ANIC); ♂, 43.22S 146.09E Tas. Celery Top Island Bathurst Harbour 15 Mar.-15Apr.1991 E. Edwards, J. Berry F.I.T. #2/F.I.T. ANIC 1180 closed forest (ANIC); ♀, 12 km E of Strahan Tas. 21 Jan 1982 G. Bornemissza /Berlesate ANIC 9125 (ANIC); ♂, Cradle Mt Tas. H.J.C. 1.18 T. (ANIC); ♂, Waldheim, Cradle Mt Tas. 12-14.ii.1967. G. Monteith (QM); ♂, AUST Tas. Cradle Mt NP, Waldheim Forest. *Nothofagus* & King Billy Pine: Litter. 145.57'E. 41.39'S. 1000 m. R. Raven & J. Gallon 1 Feb 1987 (QM); ♂, Warra LTER: Manuka Rd Tas.: 43.07 S x 146.67 E SSTCON338 Pit 02 of 10 Apr 2007 Control R. Bashford FT FT40131 (FTIC); ♂, Warra LTER: Manuka Rd Tas.: 43.07 S x 146.67 E SSTBIG1/U Pit 1 of 6 Apr-2002 Post-logging

R. Bashford FT11/43 (FTIC); ♂, Tas,Warra LTER, Manuka Rd, 43.07S x 145.67E, SSTMID,160 Pit 4 of 6, Mar 2002, Post logging, R Bashford, FT11670 (FTIC); ♀, Tas, Warra LTER, Manuka Rd, 43.07S x 145.67E, SSTMID160, Pit 5 of 6, Feb 2002, Post logging, R Bashford, FT11535 (FTIC); ♂, Warra LTER: Manuka Rd Tas.: 43.07 S x 146.67 E SSTTOP070 Pit 6 of 10 Sep 2002 Post-logging R. Bashford FT FT26594 (FTIC); ♀, Warra LTER: Manuka Rd Tas.: 43.07 S x 146.67 E SSTTOP070 Pit 3 of 10 Jun 2002 Post-logging R. Bashford FT FT14496 (CBM); ♀, Warra LTER: Manuka Rd Tas.: 43.07 S x 146.67 E SSTTOP070 Pit 6 of 10 May 2002 Post-logging R. Bashford FT FT11914 (FTIC); ♀, Warra LTER: Manuka Rd Tas.: 43.07 S x 146.67 E SSTTOP070 Pit 7 of 10 May 2002 Post-logging R. Bashford FT FT11915 (FTIC); ♀, Warra LTER: Manuka Rd Tas.: 43.07 S x 146.67 E SSTNEW058 Pit 03 of 10 Feb 2005 Pre-logging R. Bashford FT35391 (FTIC); ♀, Warra LTER: Manuka Rd Tas.: 43.07 S x 146.67 E SSTTOP070 Pit 1 of 10 Series 17 16-Feb-99 R. Bashford FT8647 (FTIC); ♂, Warra LTER: Manuka Rd Tas.: 43.07 S x 146.67 E SSTCON338 Pit 04 of 10 May 2007 Control R. Bashford FT FT40238 (CBM); ♂, Warra LTER: Manuka Rd Tas.: 43.07 S x 146.67 E SSTSMA254 Pit 10 of 10 Apr 2000 Post-logging R. Bashford FT FT9790 (CBM); ♂, Tas, Warra LTER, Manuka Rd, 43.07S x 145.67E, SSTMID160, Pit 9 of 10, Jan 2005, Post logging, R Bashford, FT35016 (FTIC); ♂, Tas., Warra LTER, Manuka Rd, 43.07S x 145.67E, SSTTOP070, Pit 2 of 10, Sep 2001, Post-logging, R Bashford, FT10922 (FTIC); ♂, Tas, Warra LTER, Manuka Rd, 43.07S x 145.67E, SSTCON338, Pit 9 of 10, Apr 2006, Control, R Bashford, FT37217 (FTIC); ♂, Tas,Warra LTER, Manuka Rd, 43.07S x 145.67E, SSTBIG106, Pit 6 of 6, Oct 2001, Post logging, R Bashford, FT10962 (FTIC); ♀, Tas,Warra LTER, Manuka Rd, 43.07S x 145.67E, SSTNEW058, Pit 1 of 10, Feb 2005, Pre-logging, R Bashford, FT35389 (FTIC); ♀, Tas,Warra LTER, Manuka Rd, 43.07S x 145.67E, SSTBIG254, Pit 2 of 6, Aug 2001, Post logging, R Bashford, FT10752 (FTIC); ♂, Tas,Warra LTER, Manuka Rd, 43.07S x 145.67E, SSTSMA663, Pit 10 of 10, Sep 1999, Post logging, R Bashford, FT9266 (FTIC); ♀, Tas, Warra LTER, 43.07S x 145.67E, Log decay Invert project, Emergence trap 5 lower, OG log 1 May 2002 R.Bashford FT14166 (FTIC); ♀, Tas, Warra LTER, 43.07S x 145.67E, Log decay Invert project, Emergence trap 1 lower, OG log 6 Oct 2006 R.Bashford FT32232 (FTIC); ♂, Tarraleah: Homes Dam area Tas.: 42.272S x 146.361 E Tarraleah WHS fauna proj. Pit # 2.3 WHS Apr 2003 M.McDonald FT23196 (FTIC); ♂, Tarraleah: Homes Dam area Tas.: 42.372S x 146.361 E Tarraleah WHS fauna proj. Pit # 2.2 WHS Apr 2003 M.McDonald FT23195 (CBM); ♀, Tas. Tarraleah: Homes Dam 42.275 S x 146.3583 E Tarraleah WHS 7.4 Pitfall trap 19-Feb-92 R. Brereton FT21283 (FTIC); ♀, Tas, Tarraleah Homes Dam area, 42.272S x 146.361E, Tarraleah WHS fauna project, Pit 2.3, Jun 2003, M.McDonald, FT23520 (FTIC); ♂, Tas, Tarraleah Homes Dam area, 42.329S x 146.359E, Tarraleah WHS fauna project, Pit WHS 9.4, Feb 1992, R.Brereton, FT21295 (FTIC); ♀, Tas, Tarraleah Butlers Rd area, 42.304S x 146.3612E, Tarraleah WHS fauna project, Pit A6 CON, Jun 2003, M.McDonald, FT23649 (FTIC); ♀, Tas, Tarraleah Butlers Rd area, 42.304S x 146.3612E, Tarraleah WHS fauna project, Pit 1.4, Mar 2003, M. McDonald, FT23029 (FTIC); ♀, Tas.. Hartz Road 43.1601 S 146.8021 E Yee Log Invertebrate Study Hand collection HS3.5 16-May-00 M.Yee FT29187 (CBM); ♀, Tas.. Harz Road 43.1601 S 146.8021 E Yee Log Invertebrate Study Hand collection HL1.5 13-Mar-00 M.Yee FT29121 (FTIC); ♀, Tas.. Harz Road 43.1601 S 146.8021 E Yee Log Invertebrate Study Hand collection HS3.3 16-May-00 M.Yee FT29185 (CBM); ♀, Tas. Hartz Rd, 43.1601S x 146.8021E, Yee Log Invertebrate Study, Hand collection, HL2.4 Mar 2000 M.Yee FT29130 (FTIC); ♂, Tas. Hartz Rd, 43.1601S x 146.8021E, Yee Log Invertebrate Study, Hand collection, HL1.5 Mar 2000 M.Yee FT29121 (FTIC); ♂, Tas.: West Picton Road 43.1672 S x 146.6869 E Yee Log Invertebrate Study Log emergence trap PR2LET3 15-Nov-00 M.Yee FT29604 (FTIC); ♂, 2♀♀, Tas, West Picton Rd, 43.1672S x 146.6869E, Yee Log Invertebrate Study, Log emergence trap, PR2SET2 Nov 2000 M.Yee FT29635 (x3) (FTIC); ♂, Tas, West Picton Rd, 43.1672S x 146.6869E, Yee Log Invertebrate Study, Log emergence trap, PR2SET1 Nov 2000 M. Yee FT29619 (FTIC); ♀, Tas. South West Road Spur 43.0826 S 146.7223 E Yee Log Invertebrate Study Log emergence trap SLET3 13-Dec-00 M.Yee FT29776 (FTIC); ♀, Tas Scotts Peak Rd, 42.5807S x 146,228E, Driscoll rainforest patch survey, pitfall site B2B, Mar 2003, D.Driscoll, FT44093 (FTIC); ♂, Tas Scotts Peak Rd, 42.5807S x 146,228E, Driscoll rainforest patch survey, pitfall site B3A, Mar 2003, D. Driscoll, FT44095 (FTIC).

Diagnosis. A rather small and short, more or less distinctly coloured species, distinguished from *S. limbatus* by margin of the elytra not crenulate, less curved aedeagus, and multisetose apex of the left paramere; and from *S. leai* by less vividly coloured elytra, in particular without dark 8th interval, smaller aedeagus with little curved apex, and basally far less curved right paramere.

Description. *Measurements.* Length: 5.1-6.1 mm; width: 2.55-3.15 mm. Ratios. Width/length of pronotum: 1.93-1.95; width base/apex of pronotum: 1.79-1.85; width widest diameter/base of pronotum: 1.0-1.01; width of pronotum/width of head: 1.83-1.88; length/width of elytra: 1.09-1.14; width elytra/pronotum: 1.0-1.02.

Colour. (Fig. 25) Inconspicuous. Head and pronotum piceous to almost black, palpi and antennae reddish, legs brown to piceous. Pronotum with

TABLE 2. Measurements and ratios of the species of *Stichonotus* Sloane, 1910. N = number of specimens measured; body length in mm; w/l pr = ratio width/length of pronotum; b/a pr = ratio width of base/width of apex of pronotum; dia/b pr = ratio widest diameter/width of base of pronotum; pr/h = ratio width of pronotum/width of head; l/w el = ratio length/width of elytra; el/pr = ratio width of elytra/width of pronotum.

	N	body length	w/l pr	b/a pr	dia/b pr	pr/h	l/w el	el/pr
decoloratus	6	5.1-6.1	1.93-1.95	1.79-1.85	1.0-1.01	1.83-1.88	1.09-1.14	1.00-1.02
leai	4	5.4-5.9	1.92-1.97	1.74-1.82	1.01-1.02	1.80-1.86	1.19-1.21	0.99-1.01
limbatus	6	5.9-6.8	1.93-2.00	1.76-1.80	1.0-1.01	1.86-1.90	1.20-1.28	1.01-1.03
piceus	6	6.5-8.2	1.78-1.85	2.04-2.15	1.0-1.01	2.18-2.26	1.30-1.33	1.01-1.03

rather inconspicuous, reddish margin which in anterior half is narrow but is widened towards base. Elytra piceous to almost black, with inconspicuous, narrow reddish margin which is widened in apical fifth or sixth. At apex only the sutural interval is dark.

Head. (Fig. 25) Of average size and shape, more than half as wide as the prothorax. Surface slightly impressed anterior-medially of the eye. Head not widened behind eye. Surface with fine, distinct, isodiametric microreticulation.

Pronotum. (Fig. 25) Of average size and shape. Apex deeply excised, apical angles acute. Lateral margins evenly convex, pronotum widest at base. Base les than twice as wide as apex, rather deeply excised, basal angles acute, far less than 90°. Apex margined, base not margined, median line rather impressed. Surface comparatively convex. Basal impression comparatively deep, rather punctiform.

Elytra. (Fig. 25) Short and wide, shorter than in all other species, upper surface comparatively convex. Lateral margins convex throughout, even in basal third barely straight. Humeral angle comparatively obtuse. Striae complete, rather deep, impunctate, interval convex. Scutellary puncture situated at junction of 2nd and 3rd striae. Marginal series consisting of 12 rather regularly spaced punctures. Microreticulation composed of fine, very superficial, very transverse meshes and lines, surface rather glossy and iridescent.

Lower surface. Metepisternum quadrate. Microreticulation very fine and highly superficial, slightly transverse, surface glossy. Terminal abdominal sternum bisetose in both sexes.

Legs. Of average size and shape. 1st–4th tarsomeres of the male protarsus slightly widened and squamose.

Male genitalia. (Fig. 17) Genital ring short and wide, oval. Aedeagus very narrow and elongate, barely sinuate; lower surface regularly concave throughout; apex triangularly tapering, slightly curved to left. Orifice elongate, largely situated on the right side. Internal sac very simply structured, with one elongate, slightly sclerotized fold. Both parameres large; left paramere shorter than right one, moderately wide, with narrow, triangular, slightly bent down apex, lower surface with some elongate setae immediately at apex; right paramere longer than left, narrow, moderately curved, with triangularly tapering apex, lower surface in apical third with two very dense fringes of very elongate hairs.

Female gonocoxites. (Fig. 9) Gonocoxite 1 elongate, rather narrow, with many rather elongate nematiform setae at median margin and in median half of lower surface, also with some short nematiform setae on the median part of the apex and on the apical part of the lower surface along the border of the hyaline area; gonocoxite 2 narrow, short, straight, almost parallel-sided, with slightly rounded apex which bears one short nematiform seta originating close to apex from a circular pit.

Variation. Little variation noted.

Distribution. Widely distributed mainly in western and southern Tasmania.

Collecting circumstances. A common, ground living species which occurs in open to dense forest. According to information kindly received from Lynette Forster and Simon Grove of Forestry Tasmania this species is most common in somewhat disturbed environments.

KEY TO SPECIES OF *STICHONOTUS*

1. Elytra longer, slightly oviform, almost parallel-sided in basal third (Fig. 23); intervals rather depressed; microreticulation of intervals distinct, isodiametric, therefore surface rather dull; lateral margins of pronotum very convex, apex comparatively narrow, ratio base/apex >2.05; basal margin of pronotum less concave (Fig. 23); aedeagus less curved, apex asymmetric and acute; both parameres stouter, left paramere asetose at apex (Fig. 15); gonocoxite 1 densely setose, but without distinct stout setae in apical part (Fig. 7). Tas. . . . . *piceus* Sloane, 1915
– Elytra shorter, more oviform, slightly convex in basal third (Figs 22, 24, 25); intervals fairly convex; microreticulation of intervals superficial, consisting of very fine, transverse lines, therefore surface rather glossy; lateral margins of pronotum less convex, apex wider, ratio base/apex < 1.85; basal margin of pronotum more concave (Figs 22, 24, 25); aedeagus more curved, apex less asymmetric and less acute; both parameres narrower, left paramere with more than one seta at apex (Figs 14, 16, 17); gonocoxite 1 with distinct stout setae in apical part (Figs 6, 8, 9). 2

2. Elytra short, but not markedly oviform, almost parallel-sided in basal third; marginal channel distinctly crenulate; elytral striae perceptibly crenulate (Fig. 24); aedeagus markedly but regularly curved, apex straight; both parameres regularly curved, left paramere narrow, with a single seta at apex (Fig. 16); gonocoxite 1 completely setose, with very elongate stout setae in apical part (Fig. 8). SW Vic . . . . . *limbatus* Sloane, 1915
– Elytra short and quite oviform, marginal channel not crenulate; elytral striae not crenulate (Figs 22, 25); aedeagus less curved, apex either asymmetric or slightly curved to the right; left paramere wider, with several elongate setae at apex (Figs 14, 17); gonocoxite 1 variously setose, but with less elongate stout setae in apical part (Figs 6, 9) Tas 3

3. Colouration of elytra less bright, 8th interval without distinct dark stripe (Fig. 25); aedeagus smaller, >1.25 mm long, far less curved, apex less curved to the right; parameres less curved and less odd-shaped, left paramere stouter, with several elongate setae at apex, right paramere regularly curved (Fig. 17); gonocoxite 1 not completely setose, with much smaller stout setae in apical part (Fig. 9) *decoloratus* sp. nov.
– Colouration of elytra brighter, 8th interval with distinct dark stripe (Fig. 22); aedeagus larger, c. 1.5 mm long, far more curved, apex much more curved to the right; parameres markedly curved and odd-shaped, left paramere narrower, with a few short setae at apex, right paramere irregularly curved, rather boomerang-shaped (Fig. 14); gonocoxite 1 completely setose, with much larger stout setae in apical part (Fig. 6) . . . . . *leai* Sloane, 1910

Migadopidiella Baehr, 2009

Migadopidiella Baehr, 2009: 32.

Type species. *Migadopidiella convexipennis* Baehr, 2009, by original designation.

Diagnosis. Small species, either unicolourous black or blackish-piceous with eight indistinct reddish spots on the elytra; elytral striae punctate; aedeagus short and compact with the orifice on the left side and several complexly folded and denticulate sclerites inside the internal sac; parameres large and rather similarly shaped, left asetose at apex, right densely setose along most of the lower surface.

Distribution. Two species, *M. convexipennis* Baehr, 2009 and *M. octoguttata* Baehr, 2009, both recorded from the Central Highlands, Tasmania.

Note. For additional information, description of the species, and figures of habitus and male

and female genitalia see Baehr (2009). This genus belongs in the subtribe (Amarotypina which presently also includes only *Amarotypus edwardsii* Bates, 1872 from New Zealand. According to Larochelle & Larivière (2007) and Johns (2010) that genus includes additional undescribed species in New Zealand.

REMARKS

With respect to body shape and the female gonocoxites, the new genus *Dendromigadops* can be placed in the subtribe Migadopina, but as the male genitalia are unknown, its systematic position among the Australian and New Zealand genera remains obscure. Certainly the species of this genus are outstanding in their body shape and the extremely large eyes. However, the dense setosity of the female gonocoxite 1 and the small, parallel sided gonocoxite 2 are quite similar to those of the genera *Decogmus* from NSW and to those of the Tasmanian genus *Calyptogonia*, less so to those of *Stichonotus*. In external features, however, *Dendomigadops* lacks compelling similarities with *Decogmus* and *Calyptogonia*, whereas the wide prothorax, deeply excised at the apex, and the retracted head are rather similar to those of *Stichonotus*. In view of the strange shape of body, female gonocoxites, its putative arboricolous habits, and its unusual distribution, this genus seems to occupy a somewhat separate systematic position because of apparent lack of clear synapomorphies, and indeed, it may represent one of the most derived genera of Migadopini.

Dendromigadops extends the range of the tribe Migadopini far north into the tropics. This is surprising, because the tribe is regarded as a circumantartic that in Australia belongs to the cool adapted, so-called Bassian faunal element. Species of this group usually occur in the wet and cool south-east of Australia and Tasmania, and a few species are found in the extreme south-west. However, a number of species of certain tribes or genera which are believed to represent true Bassian elements, range far north into the so-called Torresian zone along the east coast of Australia (Baehr 1995, 2003a). But in south-eastern and even more so in north-eastern Queensland, they almost exclusively occur on tablelands and on the summits of high mountains, where they inhabit temperate or subtropical montane rain forests and are typically found in *Nothofagus* forest. Baehr (2003a, 2003b) therefore stressed the superposition of such Bassian over Torresian environments and their inhabitants along the Great Dividing Range over almost the whole east coast of Queensland, except Cape York Peninsula. Most probably this was caused by the drift of the Australian plate through most of Tertiary to the north, the uplift of the Great Dividing Range along the east coast, and the resulting retreat of southern, temperate, Bassian environments to the highest tops of mountains and tablelands. At the same time, this drift facilitated the immigration of northern, Torresian floral and faunal elements into the lowlands of eastern Australia. Accordingly to their Bassian origin the two species of the genus *Dendromigadops* were found only at high altitude in montane rain forest.

Another problem is the apparent rarity of these species, the montane rain forests of eastern Australia have been reasonably well collected by a number of keen collectors during the last century. Why have these large and impressive species escaped the notice of collectors for so long? It seems that the apparent arboricolous, and most probably nocturnal, habits answer this question. To capture beetles with this habit and in this habitat require targeted collecting methods not frequently used. Both holotypes of the new species were collected arboreally whereas the paratype of *Dendromigadops alticola* was captured in a Malaise trap, which means that this species flies.

For this reason, I suggest that the species are not as rare as they seem to be, and, moreover, that additional species may occur in the vast area between the ranges of the southern and northern populations. Either the species may occur in the canopy of rain forest trees and the few recorded specimens are only serendipitously collected stragglers, which forayed down the trees instead of staying in the crowns where they normally remain, or they may live inside hollow trunks or branches of rain forest

trees. In the latter case they may leave these only occasionally and at night. The speculation that they live in tree-hollows is supported by the quite similar body shape of the species of *Dendromigadops* and certain melisoderine species of the tribe Psydrini which are known to occur inside hollow trunks and branches presumably feeding on beetle larvae in decaying wood (Baehr 2011). These tree-hollow beetles include species of *Melisodera* Westwood and *Moriodema* Castelnau, which share with *Dendromigadops* the short broad, powerful body with wide pronotum, short, strong legs, large eyes and short broad mandibles. This body-form and features may equip them for this lifestyle. All these taxa are extremely rarely collected possibly indicating how infrequently these putatively arboreal, cavity-living forms come to ground level.

The very large eyes of both species of *Dendromigadops*, in comparison to the eyes of other migadopine species, and the fact that the holotype of *D. alticola* was definitely collected at night, suggest a strictly nocturnal way of life. This again would explain the rarity of the species in collections.

This short review of the described Australian genera and species of Migadopini reveals a surprisingly high level of diversity in body shape and structure, including diversity of shape and structure in both male and female genitalia. Usually, such morphological diversity is noted in old, relict groups which have lost most of their relatives within geological time, so that only a few, markedly diverse genera have survived. It is well known that Migadopini are plesiomorphic in many respects, so that they usually are arranged quite near the roots of the phylogenetic tree of Carabidae. Their high level of diversity, therefore, may corroborate their old age and their relict status.

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